4-1-2002

Herbicide Evaluation in Arkansas Rice 2000

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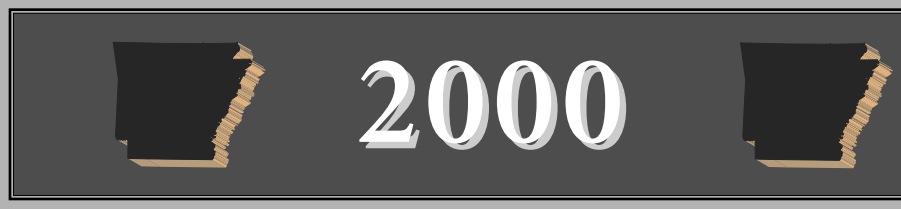

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ARKANSAS AGRICULTURAL EXPERIMENT STATION
Division of Agriculture University of Arkansas
April 2002 Research Series 492

This publication is available on the web at: http://www.uark.edu/depts/agripub/Publications/

Additional printed copies of this publication can be obtained free of charge from Communication Services, 110 Agriculture Building, University of Arkansas, Fayetteville, AR 72701.

Layout and editing by Marci Milus

Technical editing and cover design by Cam Romund

Arkansas Agricultural Experiment Station, University of Arkansas Division of Agriculture, Fayetteville. Milo J. Shult, Vice President for Agriculture and Director; Gregory J. Weidemann, Dean, Dale Bumpers College of Agricultural, Food and Life Sciences and Associate Vice President for Agriculture–Research, University of Arkansas Division of Agriculture. WebonlyPM6.5. The University of Arkansas Division of Agriculture follows a nondiscriminatory policy in programs and employment.
ISSN:0099-5010 CODEN:AKAMA6


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UNIVERSITY OF ARKANSAS
DIVISION OF AGRICULTURE

HERBICIDE EVALUATION IN ARKANSAS RICE, 2000

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ACKNOWLEDGMENTS

The authors acknowledge the Arkansas Rice Research and Promotion Board for financial support for some of these experiments. The following companies provided financial support and chemicals used in the studies: Aventis, BASF, Bayer, Cedar, Dow AgroSciences, DuPont, FMC, Helena, Monsanto, RiceCo, Syngenta, Terra, and Valent.

The assistance of the following individuals is gratefully acknowledged: Howard Black, Biological Technician, Dale Bumpers National Rice Research Center; John Robinson, Director, and Ronnie Sherman, Farm Manager, Rice Research and Extension Center, Stuttgart; Vaughn Skinner, Farm Manager, Main Experiment Station, Fayetteville; and Marci Milus and Lynn McCoy, administrative professional staff.

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HERBICIDE EVALUATION IN ARKANSAS RICE, 2000

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INTRODUCTION

With the widespread development of resistance to propanil by barnyardgrass, the major weed in rice, research has been intensified in recent years to develop alternative weed control technology to the repeated use of propanil. The use of herbicides is economically important for production of rice. Field experiments are conducted annually in Arkansas to evaluate the activity of developmental and commercial herbicides for selective control of barnyardgrass and other weeds in rice. These experiments serve both industry and Arkansas agriculture by providing information on the selectivity of herbicides still in the developmental stage and by comparing the activity of these new herbicides with that of recommended herbicides.

The research reported herein is a compilation of data from experiments conducted by Ronald Talbert and his assistants, Eric Scherder, Research Specialist; Mike Lovelace, Research Specialist; and Nathan Buehring, Graduate Assistant, located at the Main Experiment Station, Fayetteville, and conducting research at Fayetteville and at the Rice Research and Extension Center, Stuttgart.

Common names of the herbicides presented in data tables are referenced to trade names and sponsoring companies in Appendix Table 1. The scientific names of the plants evaluated and their associated Bayer codes are listed in Appendix Table 2. Climatological data for 1999 are presented in Appendix Tables 3 thru 6.

GENERAL METHODS, 2000

Pertinent information specific to each field test precedes each data table. Included is information on general field conditions, field maintenance, and herbicide application and general conclusions from the data. All test areas were fertilized as recommended from soil tests. Weed densities were taken in most experiments and are presented in each table. Densities, expressed as no./ft^2 , are natural populations. Those expressed as no./row ft were seeded in rows across the rice rows.

The herbicides used in these studies are designated in the tables by the common name proposed to or accepted by the Weed Science Society of America or, when common names are unavailable, by code number designation. A trade name is specified for compounds having more than one trade name or manufacturer. The Stam® EC formulation was used where propanil formulation is not designated. Herbicides formulated as prepackaged mixtures are listed in tables by their component herbicides in parentheses. All herbicide rates are expressed in pounds of active ingredient (lb/A) on a broadcast basis. Adjuvant rates are expressed as percent volume/volume.

The standard procedures outlined here were used throughout all the studies unless otherwise specified. All studies were conducted at the Rice Research and Extension Center at Stuttgart, Arkansas, on a DeWitt silt loam (fine, smectitic, thermic, Typic, Albaqualfs) with

1% organic matter and a pH of 5.3. Rice was seeded May 14, 2000, in plots eight rows wide (7-in row spacing) and 16 ft in length. The rice cultivar Wells was used in all tests unless otherwise specified. Propanil-resistant and -susceptible barnyardgrass (*Echinochloa crus-galli*), broadleaf signalgrass (*Brachiaria platyphylla*), pitted morningglory (*Ipomoea lacunosa*), tall morningglory (*Ipomoea purpurea*), northern jointvetch (*Aeschynomene virginica*), and hemp sesbania (*Sesbania exaltata*) were sown in single rows perpendicular to the rows of rice. Evaluations for the control of weeds, along with natural infestations of propanil-resistant barnyardgrass, bearded sprangletop (*Leptochloa fascicularis*), Amazon sprangletop (*Leptochloa panicoides*), and broadleaf signalgrass (if present) were made.

Visual ratings of rice injury, rice biomass reduction, and weed control were taken 7, 14, 21, 28, 42, and 56 days after rice emergence (DAE) for soil-applied herbicides and over these same time periods as days after treatment (DAT) for postemergence treatments. Percentages of weed control and crop injury were visually estimated: 0% represents no effect, and 100% represents complete kill. Rice yield was taken from the four center rows and adjusted to 12% moisture. Rice yield is reported as lb/A; 1 bushel = 45 pounds. Data were subjected to analysis of variance, and the LSD (least significant difference) test at the 5% level of significance was used for separation of means.

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ABBREVIATIONS OF TERMS

The following abbreviations are used in tables:

BF, before flood
BkPkCO_2, CO_2 backpack sprayer
Cot., cotyledon
DAT, days after treatment
DF, dry flowable formulation
DPRE, delayed preemergence
EC, emulsifiable concentrate
EPOST, early postemergence
F, flowable formulation
fb, followed by
form., formulation
FF, flat fan nozzle
Gpa, gallons per acre
G or GR, granular formulation
lf, leaf
LPOST, late postemergence
LSD, least significant difference
ME, microencapsulated
MP-44, annual weed control recommendations for Arkansas
MPOST, mid-postemergence timing
N-ECHCG, natural population of barnyardgrass
N/A, not applicable or not available
Noz, nozzles
NS, not significant
PI, panicle initiation
POFL, after flood
POST, postemergence
PPI, preplant incorporated
PPL, preplant (not incorporated)
PRE, preemergence
PREFL, preflood
RCB, randomized complete block (experimental design)
R-ECHCG, propanil-resistant barnyardgrass
S-ECHCG, propanil-susceptible barnyardgrass
Till, tillering
WAF, weeks after flood
XR, extended range nozzle

Table 1. Graminicides, rates, and timings, Stuttgart, 2000.

SUMMARY

Fenoxaprop + safener (Ricestar), cyhalofop-butyl (Clincher), and clefoxydim (Aura) were evaluated for their grass activity on propanil-resistant and -susceptible barnyardgrass, broadleaf signalgrass, and Amazon sprangletop. Each herbicide was evaluated at three rates at 2- to 3-leaf and 4- to 6-leaf grass stages and as a sequential treatment at both timings. Fenoxaprop + safener was evaluated at 0.04, 0.06, and 0.08 lb ai/A; cyhalofop-butyl was evaluated at 0.125, 0.188, and 0.25 lb ai/A; and clefoxydim was evaluated at 0.0445, 0.067, and 0.089 lb ai/A

For effective control of propanil-resistant and -susceptible barnyardgrass and Amazon sprangletop two applications were needed for each of these graminicides. Fenoxaprop + isoxadifen, regardless of rate, controlled broadleaf signalgrass at either application timing or in a sequential program. Cyhalofop-butyl and clefoxydim controlled broadleaf signalgrass >86% at the 4- to 6-leaf timing only. This level of control, however, has not been observed in previous research with these two compounds.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 7.3

Planting date ..... May 17, 2000
Harvest date ..... September 20, 2000
Crop / Variety ..... rice / Bengal
Dates of flushing ..... May 25 and 30, June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: 2-3 LF = 2- to 3-leaf rice; and PREFL = preflood.

Application type	2-3 LF	PREFL
Date applied	June 2, 2000	June 18, 2000
Time	9:00 am	7:00 pm
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	89 / 82	82 / 78
Relative humidity (%)	58	77
Wind (mph)	1	3
Cloud cover (%)	10	70
Soil moisture	saturated	saturated
Crop stage/Height	2 lf / 6"	4 lf / 11"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet DG / 110015
Boom ht / # Noz / Spacing (in.)	18 / 3 / 18	25 / 3 / 18
Gpa / Psi	10 / 20	10 / 20
Weed species (density)	---------- [# leaves/height (in.)] ----------	
S-ECHCG (10/row ft)	1 lf / 0.5"	4 lf / 8"
R-ECHCG (26/row ft)	2 lf / 2"	5 lf / 12"
N-ECHCG (8/ft^2)	2 lf / 2"	8 lf / 12"
BRAPP (22/row ft)	2 lf / 1"	5 lf / 6"

Table 1. Section 1.

				Barnyardgrass control							
			Application	Resistant (R-ECHCG)				Susceptible (S-ECHCG)			
	Herbicide	Rate	timing	6/8	6/28	7/18	8/16	6/8	6/28	7/18	8/16
		(lb ai/A)		---------- (%) ----------							
1	(Fenoxaprop + safener) + Agri-Dex	0.04 1%	2-3 LF 2-3 LF	89	92	94	95	89	76	75	78
2	(Fenoxaprop + safener) + Agri-Dex	0.06 1%	2-3 LF 2-3 LF	94	95	96	96	93	90	82	85
3	(Fenoxaprop + safener) + Agri-Dex	0.08 1%	2-3 LF 2-3 LF	95	98	95	98	95	91	78	84
4	Cyhalofop + Agri-Dex	0.125 2.5%	2-3 LF 2-3 LF	73	74	80	66	73	71	63	63
5	Cyhalofop + Agri-Dex	0.188 2.5%	2-3 LF 2-3 LF	79	69	88	74	81	69	68	64
6	Cyhalofop + Agri-Dex	0.25 2.5%	2-3 LF 2-3 LF	83	80	85	80	85	75	65	66
7	Clefoxydim + Agri-Dex	0.0445 1%	2-3 LF 2-3 LF	88	79	90	70	88	70	68	64
8	Clefoxydim + Agri-Dex	0.067 1%	2-3 LF 2-3 LF	91	88	95	83	94	75	70	74
9	Clefoxydim + Agri-Dex	0.089 1%	2-3 LF 2-3 LF	94	88	92	91	94	80	75	78
10	(Fenoxaprop + safener) + Agri-Dex	0.04 1%	PREFL PREFL	0	48	71	43	0	48	55	45
11	(Fenoxaprop + safener) + Agri-Dex	0.06 1%	PREFL PREFL	0	49	86	65	0	51	68	64
12	(Fenoxaprop + safener) + Agri-Dex	0.08 1%	PREFL PREFL	0	63	91	83	0	64	76	73
13	Cyhalofop + Agri-Dex	0.125 2.5%	PREFL PREFL	0	43	65	56	0	44	56	56
14	Cyhalofop + Agri-Dex	0.188 2.5%	PREFL PREFL	0	41	76	69	0	43	65	65
15	Cyhalofop + Agri-Dex	0.25 2.5%	PREFL PREFL	0	59	88	93	0	53	70	84
16	Clefoxydim + Agri-Dex	0.0445 1%	PREFL PREFL	0	49	55	43	0	46	50	45
17	Clefoxydim + Agri-Dex	0.067 1%	PREFL PREFL	0	68	95	90	0	64	81	84
18	Clefoxydim + Agri-Dex	0.089 1%	PREFL PREFL	0	81	98	98	0	76	91	92
19	(Fenoxaprop + safener) + Agri-Dex *fb* (fenoxaprop + safener) + Agri-Dex	0.04 1% 0.04 1%	2-3 LF 2-3 LF PREFL PREFL	90	98	98	96	91	93	95	90
20	(Fenoxaprop + safener) + Agri-Dex *fb* (fenoxaprop + safener) + Agri-Dex	0.06 1% 0.06 1%	2-3 LF 2-3 LF PREFL PREFL	95	98	98	98	95	98	98	96
21	(Fenoxaprop + safener) + Agri-Dex *fb* (fenoxaprop + safener) + Agri-Dex	0.08 1% 0.08 1%	2-3 LF 2-3 LF PREFL PREFL	95	98	98	98	95	96	98	98

continued

Table 1. Section 1. Continued.

				Barnyardgrass control							
				Resistant (R-ECHCG)				Susceptible (S-ECHCG)			
	Herbicide	Rate	Application timing	6/8	6/28	7/18	8/16	6/8	6/28	7/18	8/16
		(lb ai/A)		(%)							
22	Cyhalofop +	0.125	2-3 LF	71	96	98	96	71	87	92	96
	Agri-Dex *fb*	2.5%	2-3 LF								
	cyhalofop +	0.125	PREFL								
	Agri-Dex	2.5%	PREFL								
23	Cyhalofop +	0.188	2-3 LF	81	98	98	98	81	96	96	96
	Agri-Dex *fb*	2.5%	2-3 LF								
	cyhalofop +	0.188	PREFL								
	Agri-Dex	2.5%	PREFL								
24	Cyhalofop +	0.25	2-3 LF	85	98	98	98	86	98	96	96
	Agri-Dex *fb*	2.5%	2-3 LF								
	cyhalofop +	0.25	PREFL								
	Agri-Dex	2.5%	PREFL								
25	Clefoxydim +	0.0445	2-3 LF	84	96	98	95	84	90	96	88
	Agri-Dex *fb*	1%	2-3 LF								
	clefoxydim +	0.0445	PREFL								
	Agri-Dex	1%	PREFL								
26	Clefoxydim +	0.067	2-3 LF	93	98	98	98	93	98	98	98
	Agri-Dex *fb*	1%	2-3 LF								
	clefoxydim +	0.067	PREFL								
	Agri-Dex	1%	PREFL								
27	Clefoxydim +	0.089	2-3 LF	94	98	98	98	94	96	96	96
	Agri-Dex *fb*	1%	2-3 LF								
	clefoxydim +	0.089	PREFL								
	Agri-Dex	1%	PREFL								
28	Untreated			0	0	0	0	0	0	0	0
	LSD (0.05)			4	11	10	14	5	10	10	12

continued

Table 1. Section 2.

				Weed control					
				Broadleaf signalgrass (BRAPP)				Amazon sprangletop (LEFPA)	
	Herbicide	Rate	Application timing	6/8	6/28	7/18	8/16	7/18	8/16
		(lb ai/A)		(%)					
1	(Fenoxaprop + safener) +	0.04	2-3 LF	88	93	98	95	98	95
	Agri-Dex	1%	2-3 LF						
2	(Fenoxaprop + safener) +	0.06	2-3 LF	93	96	98	95	98	98
	Agri-Dex	1%	2-3 LF						
3	(Fenoxaprop + safener) +	0.08	2-3 LF	94	98	98	98	98	96
	Agri-Dex	1%	2-3 LF						
4	Cyhalofop +	0.125	2-3 LF	70	74	91	64	90	85
	Agri-Dex	2.5%	2-3 LF						
5	Cyhalofop +	0.188	2-3 LF	75	74	85	67	98	81
	Agri-Dex	2.5%	2-3 LF						
6	Cyhalofop +	0.25	2-3 LF	84	78	90	80	97	92
	Agri-Dex	2.5%	2-3 LF						

continued

Table 1. Section 2. Continued.

				Weed control					
				Broadleaf signalgrass (BRAPP)				Amazon sprangletop (LEFPA)	
	Herbicide	Rate	Application timing	6/8	6/28	7/18	8/16	7/18	8/16
		(lb ai/A)		(%)					
7	Clefoxydim +	0.0445	2-3 LF	66	68	79	63	92	85
	Agri-Dex	1%	2-3 LF						
8	Clefoxydim +	0.067	2-3 LF	88	82	92	67	89	96
	Agri-Dex	1%	2-3 LF						
9	Clefoxydim +	0.089	2-3 LF	85	82	92	82	95	88
	Agri-Dex	1%	2-3 LF						
10	(Fenoxaprop + safener) +	0.04	PREFL	0	75	92	94	73	70
	Agri-Dex	1%	PREFL						
11	(Fenoxaprop + safener) +	0.06	PREFL	0	88	98	89	75	86
	Agri-Dex	1%	PREFL						
12	(Fenoxaprop + safener) +	0.08	PREFL	0	81	98	98	76	88
	Agri-Dex	1%	PREFL						
13	Cyhalofop +	0.125	PREFL	0	50	85	90	66	33
	Agri-Dex	2.5%	PREFL						
14	Cyhalofop +	0.188	PREFL	0	54	88	98	50	45
	Agri-Dex	2.5%	PREFL						
15	Cyhalofop +	0.25	PREFL	0	55	92	88	68	68
	Agri-Dex	2.5%	PREFL						
16	Clefoxydim +	0.0445	PREFL	0	40	75	55	66	45
	Agri-Dex	1%	PREFL						
17	Clefoxydim +	0.067	PREFL	0	54	87	87	81	81
	Agri-Dex	1%	PREFL						
18	Clefoxydim +	0.089	PREFL	0	74	91	98	96	88
	Agri-Dex	1%	PREFL						
19	(Fenoxaprop + safener) +	0.04	2-3 LF	91	98	98	98	98	98
	Agri-Dex *fb*	1%	2-3 LF						
	(fenoxaprop + safener) +	0.04	PREFL						
	Agri-Dex	1%	PREFL						
20	(Fenoxaprop + safener) +	0.06	2-3 LF	95	98	98	98	98	98
	Agri-Dex *fb*	1%	2-3 LF						
	(fenoxaprop + safener) +	0.06	PREFL						
	Agri-Dex	1%	PREFL						
21	(Fenoxaprop + safener) +	0.08	2-3 LF	94	98	98	98	98	98
	Agri-Dex *fb*	1%	2-3 LF						
	(fenoxaprop + safener) +	0.08	PREFL						
	Agri-Dex	1%	PREFL						
22	Cyhalofop +	0.125	2-3 LF	73	93	98	98	98	96
	Agri-Dex *fb*	2.5%	2-3 LF						
	cyhalofop +	0.125	PREFL						
	Agri-Dex	2.5%	PREFL						
23	Cyhalofop +	0.188	2-3 LF	78	98	98	98	98	98
	Agri-Dex *fb*	2.5%	2-3 LF						
	cyhalofop +	0.188	PREFL						
	Agri-Dex	2.5%	PREFL						
24	Cyhalofop +	0.25	2-3 LF	78	98	98	98	98	98
	Agri-Dex *fb*	2.5%	2-3 LF						
	cyhalofop +	0.25	PREFL						
	Agri-Dex	2.5%	PREFL						

continued

Table 1. Section 2. Continued.

				Weed control					
				Broadleaf signalgrass (BRAPP)				Amazon sprangletop (LEFPA)	
	Herbicide	Rate	Application timing	6/8	6/28	7/18	8/16	7/18	8/16
		(lb ai/A)		---------- (%) ----------					
25	Clefoxydim +	0.0445	2-3 LF	68	90	96	89	98	90
	Agri-Dex *fb*	1%	2-3 LF						
	clefoxydim +	0.0445	PREFL						
	Agri-Dex	1%	PREFL						
26	Clefoxydim +	0.067	2-3 LF	79	94	98	98	98	98
	Agri-Dex *fb*	1%	2-3 LF						
	clefoxydim +	0.067	PREFL						
	Agri-Dex	1%	PREFL						
27	Clefoxydim +	0.089	2-3 LF	84	98	98	98	98	98
	Agri-Dex *fb*	1%	2-3 LF						
	clefoxydim +	0.089	PREFL						
	Agri-Dex	1%	PREFL						
28	Untreated			0	0	0	0	0	0
	LSD (0.05)			7	14	9	17	13	12

continued

Table 1. Section 3.

				Effect on rice				
				Injury				Yield
	Herbicide	Rate	Application timing	6/8	6/28	7/18	8/16	9/20
		(lb ai/A)		---------- (%) ----------				(lb/A)
1	(Fenoxaprop + safener) +	0.04	2-3 LF	16	5	0	0	6646
	Agri-Dex	1%	2-3 LF					
2	(Fenoxaprop + safener) +	0.06	2-3 LF	20	10	0	0	8442
	Agri-Dex	1%	2-3 LF					
3	(Fenoxaprop + safener) +	0.08	2-3 LF	31	10	0	0	8452
	Agri-Dex	1%	2-3 LF					
4	Cyhalofop +	0.125	2-3 LF	0	0	0	0	6748
	Agri-Dex	2.5%	2-3 LF					
5	Cyhalofop +	0.188	2-3 LF	0	0	0	0	6409
	Agri-Dex	2.5%	2-3 LF					
6	Cyhalofop +	0.25	2-3 LF	4	3	0	0	7213
	Agri-Dex	2.5%	2-3 LF					
7	Clefoxydim +	0.0445	2-3 LF	3	0	0	0	6862
	Agri-Dex	1%	2-3 LF					
8	Clefoxydim +	0.067	2-3 LF	8	0	0	0	7886
	Agri-Dex	1%	2-3 LF					
9	Clefoxydim +	0.089	2-3 LF	15	4	0	0	7405
	Agri-Dex	1%	2-3 LF					
10	(Fenoxaprop + safener) +	0.04	PREFL	0	6	0	0	5405
	Agri-Dex	1%	PREFL					
11	(Fenoxaprop + safener) +	0.06	PREFL	0	5	0	0	6803
	Agri-Dex	1%	PREFL					
12	(Fenoxaprop + safener) +	0.08	PREFL	0	5	0	0	8168
	Agri-Dex	1%	PREFL					
13	Cyhalofop +	0.125	PREFL	0	3	0	0	4704
	Agri-Dex	2.5%	PREFL					

continued

Table 1. Section 3. Continued.

				Effect on rice				
				Injury				Yield
	Herbicide	Rate	Application timing	6/8	6/28	7/18	8/16	9/20
		(lb ai/A)		---------- (%) ----------				(lb/A)
14	Cyhalofop +	0.188	PREFL	0	3	0	0	5407
	Agri-Dex	2.5%	PREFL					
15	Cyhalofop +	0.25	PREFL	0	5	0	0	7349
	Agri-Dex	2.5%	PREFL					
16	Clefoxydim +	0.0445	PREFL	0	3	0	0	4270
	Agri-Dex	1%	PREFL					
17	Clefoxydim +	0.067	PREFL	0	6	0	0	8168
	Agri-Dex	1%	PREFL					
18	Clefoxydim +	0.089	PREFL	0	10	3	0	8588
	Agri-Dex	1%	PREFL					
19	(Fenoxaprop + safener) +	0.04	2-3 LF	13	8	3	0	9460
	Agri-Dex *fb*	1%	2-3 LF					
	(fenoxaprop + safener) +	0.04	PREFL					
	Agri-Dex	1%	PREFL					
20	(Fenoxaprop + safener) +	0.06	2-3 LF	26	6	4	0	9504
	Agri-Dex *fb*	1%	2-3 LF					
	(fenoxaprop + safener) +	0.06	PREFL					
	Agri-Dex	1%	PREFL					
21	(Fenoxaprop + safener) +	0.08	2-3 LF	30	3	0	0	9181
	Agri-Dex *fb*	1%	2-3 LF					
	(fenoxaprop + safener) +	0.08	PREFL					
	Agri-Dex	1%	PREFL					
22	Cyhalofop +	0.125	2-3 LF	0	0	0	0	9238
	Agri-Dex *fb*	2.5%	2-3 LF					
	cyhalofop +	0.125	PREFL					
	Agri-Dex	2.5%	PREFL					
23	Cyhalofop +	0.188	2-3 LF	3	4	0	0	9508
	Agri-Dex *fb*	2.5%	2-3 LF					
	cyhalofop +	0.188	PREFL					
	Agri-Dex	2.5%	PREFL					
24	Cyhalofop +	0.25	2-3 LF	3	3	0	0	9524
	Agri-Dex *fb*	2.5%	2-3 LF					
	cyhalofop +	0.25	PREFL					
	Agri-Dex	2.5%	PREFL					
25	Clefoxydim +	0.0445	2-3 LF	5	3	0	0	8613
	Agri-Dex *fb*	1%	2-3 LF					
	clefoxydim +	0.0445	PREFL					
	Agri-Dex	1%	PREFL					
26	Clefoxydim +	0.067	2-3 LF	15	5	0	0	8493
	Agri-Dex *fb*	1%	2-3 LF					
	clefoxydim +	0.067	PREFL					
	Agri-Dex	1%	PREFL					
27	Clefoxydim +	0.089	2-3 LF	16	10	0	0	8654
	Agri-Dex *fb*	1%	2-3 LF					
	clefoxydim +	0.089	PREFL					
	Agri-Dex	1%	PREFL					
28	Untreated			0	0	0	0	838
	LSD (0.05)			6	8	3	0	2010

Table 2. Antagonism of graminicides tank-mixed with broadleaf herbicides, Stuttgart, 2000.

SUMMARY

Antagonism is the joint action of two herbicides (or other chemicals) such that the activity on a target species is less than would be expected if the herbicides were applied alone. The activity of fenoxaprop + safener (Ricestar), cyhalofop-butyl (Clincher), and clefoxydim (Aura) was evaluated for potential antagonism at the 4- to 5-leaf grass stage for barnyardgrass control when applied in combination with the broadleaf herbicides: bentazon + acifluorfen (Storm), bentazon (Basagran), acifluorfen (Blazer), triclopyr (Grandstand), bensulfuron (Londax), halosulfuron (Permit), carfentrazone-ethyl (Aim), or propanil (Stam M-4). Fenoxaprop + safener at 0.08 lb ai/A, cyhalofop-butyl at 0.25 lb ai/A, and clefoxydim at 0.089 lb ai/A were tank-mixed with each broadleaf herbicide applied at a labeled rate. The three graminicides were also applied alone to determine their level of grass control if antagonism is not present.

Antagonism of propanil-resistant and -susceptible barnyardgrass control was observed when fenoxaprop + isoxadifen was tank-mixed with halosulfuron or propanil: 68% and 38% control, respectively, as compared to 84% control when applied alone. All broadleaf herbicides antagonized barnyardgrass control when tank-mixed with cyhalofop-butyl except bentazon, acifluorfen, or bensulfuron. Clefoxydim activity on barnyardgrass was antagonized only when applied in combination with bentazon + acifluorfen, bentazon, or propanil.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 7.3

Planting date ..... May 17, 2000
Harvest date ..... September 20, 2000
Crop / Variety ..... rice / Bengal
Dates of flushing ..... May 25 and 30, June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: 4-5 LF = 4- to 5-leaf rice.

Application type	4-5 LF
Date applied	June 16, 2000
Time	5:00 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	86 / 88
Relative humidity (%)	70
Wind (mph)	6
Cloud cover (%)	30
Soil moisture	moist
Crop stage/Height	5 lf / 8"
Sprayer type/mph	BkPkCO_2 / 3
Nozzle type/Size	T-Jet DG / 110015
Boom ht / # Noz / Spacing (in.)	18 / 3 / 18
Gpa / Psi	10 / 20
Weed species (density)	[# leaves/height (in.)]
S-ECHCG (20/row ft)	4 lf / 5"
R-ECHCG (22/row ft)	5 lf / 8"
N-ECHCG (3/ft^2)	8 lf / 9"
BRAPP (40/row ft)	6 lf / 3"
LEFPA (5/ft^2)	5 lf / 2"
CYPIR (8/ft^2)	4 lf / 4"

Table 2. Section 1.

				Barnyardgrass control							
			Application	Susceptible (S-ECHCG)				Resistant (R-ECHCG)			
	Herbicide	Rate	timing	6/8	6/28	7/18	8/16	6/8	6/28	7/18	8/16
		(lb ai/A)		---------- (%) ----------							
1	(Fenoxaprop + safener) +	0.08	4-5LF	83	76	70	69	86	88	89	86
	Agri-Dex +	1%	4-5 LF								
	(acifluorfen + bentazon)	1.5	4-5 LF								
2	(Fenoxaprop + safener) +	0.08	4-5 LF	74	76	83	90	75	89	95	96
	Agri-Dex +	1%	4-5 LF								
	bentazon	1.5	4-5 LF								
3	(Fenoxaprop + safener) +	0.08	4-5 LF	79	76	75	75	85	88	90	84
	Agri-Dex +	1%	4-5 LF								
	acifluorfen	1.0	4-5 LF								
4	(Fenoxaprop + safener) +	0.08	4-5 LF	85	81	74	75	90	89	88	86
	Agri-Dex +	1%	4-5 LF								
	triclopyr	0.38	4-5 LF								
5	(Fenoxaprop + safener) +	0.08	4-5 LF	65	75	84	78	66	85	92	90
	Agri-Dex +	1%	4-5 LF								
	bensulfuron	0.063	4-5 LF								
6	(Fenoxaprop + safener) +	0.08	4-5 LF	53	58	61	59	54	64	70	68
	Agri-Dex +	1%	4-5 LF								
	halosulfuron	0.063	4-5 LF								
7	(Fenoxaprop + safener) +	0.08	4-5 LF	73	86	92	91	75	86	94	95
	Agri-Dex +	1%	4-5 LF								
	carfentrazone	0.02	4-5 LF								
8	(Fenoxaprop + safener) +	0.08	4-5 LF	35	43	45	38	34	43	48	38
	Agri-Dex +	1%	4-5 LF								
	propanil	4.0	4-5 LF								
9	(Fenoxaprop + safener) +	0.08	4-5 LF	79	80	80	75	80	88	91	84
	Agri-Dex +	1%	4-5 LF								
10	Cyhalofop +	0.25	4-5 LF	66	63	58	45	69	68	60	54
	Agri-Dex +	2.5%	4-5 LF								
	(acifluorfen + bentazon)	1.5	4-5 LF								
11	Cyhalofop +	0.25	4-5 LF	65	63	63	61	66	66	65	68
	Agri-Dex +	2.5%	4-5 LF								
	bentazon	1.5	4-5 LF								
12	Cyhalofop +	0.25	4-5 LF	80	75	66	61	79	78	73	70
	Agri-Dex +	2.5%	4-5 LF								
	acifluorfen	1.0	4-5 LF								
13	Cyhalofop +	0.25	4-5 LF	80	74	66	56	85	80	76	61
	Agri-Dex +	2.5%	4-5 LF								
	triclopyr	0.38	4-5 LF								
14	Cyhalofop +	0.25	4-5 LF	54	60	64	64	56	69	73	72
	Agri-Dex +	2.5%	4-5 LF								
	bensulfuron	0.063	4-5 LF								
15	Cyhalofop +	0.25	4-5 LF	45	51	53	48	43	49	53	56
	Agri-Dex +	2.5%	4-5 LF								
	halosulfuron	0.063	4-5 LF								
16	Cyhalofop +	0.25	4-5 LF	68	68	65	55	73	75	76	61
	Agri-Dex +	2.5%	4-5 LF								
	carfentrazone	0.02	4-5 LF								

continued

Table 2. Section 1. Continued.

	Herbicide	Rate	Application timing	Barnyardgrass control: Susceptible (S-ECHCG) 6/8	6/28	7/18	8/16	Resistant (R-ECHCG) 6/8	6/28	7/18	8/16
		(lb ai/A)		(%)							
17	Cyhalofop +	0.25	4-5 LF	63	60	55	49	65	63	55	55
	Agri-Dex +	2.5%	4-5 LF								
	propanil	4.0	4-5 LF								
18	Cyhalofop +	0.25	4-5 LF	69	71	74	75	73	81	85	82
	Agri-Dex	2.5%	4-5 LF								
19	Clefoxydim +	0.089	4-5 LF	46	55	60	45	56	60	63	50
	Agri-Dex +	1%	4-5 LF								
	(acifluorfen + bentazon)	1.5	4-5 LF								
20	Clefoxydim +	0.089	4-5 LF	38	40	40	33	43	44	40	33
	Agri-Dex +	1%	4-5 LF								
	bentazon	1.5	4-5 LF								
21	Clefoxydim +	0.089	4-5 LF	83	82	81	92	84	84	87	94
	Agri-Dex +	1%	4-5 LF								
	acifluorfen	1.0	4-5 LF								
22	Clefoxydim +	0.089	4-5 LF	85	80	70	71	92	85	82	85
	Agri-Dex +	1%	4-5 LF								
	triclopyr	0.38	4-5 LF								
23	Clefoxydim +	0.089	4-5 LF	69	73	74	76	75	83	88	85
	Agri-Dex +	1%	4-5 LF								
	bensulfuron	0.063	4-5 LF								
24	Clefoxydim +	0.089	4-5 LF	65	71	74	73	69	81	87	86
	Agri-Dex +	1%	4-5 LF								
	halosulfuron	0.063	4-5 LF								
25	Clefoxydim +	0.089	4-5 LF	74	78	80	85	80	85	91	94
	Agri-Dex +	1%	4-5 LF								
	carfentrazone	0.02	4-5 LF								
26	Clefoxydim +	0.089	4-5 LF	35	40	40	33	35	40	40	33
	Agri-Dex +	1%	4-5 LF								
	propanil	4.0	4-5 LF								
27	Clefoxydim +	0.089	4-5 LF	71	80	85	88	76	90	98	94
	Agri-Dex	1%	4-5 LF								
28	Untreated			0	0	0	0	0	0	0	0
	LSD (0.05)			12	10	10	17	14	10	13	20

continued

Table 2. Section 2.

				Weed control					
				Broadleaf signalgrass (BRAPP)				Amazon sprangletop (LEFPA)	
	Herbicide	Rate	Application timing	6/8	6/28	7/18	8/16	7/18	8/16
		(lb ai/A)		(%)					
1	(Fenoxaprop + safener) + Agri-Dex + (acifluorfen + bentazon)	0.08 1% 1.5	4-5LF 4-5 LF 4-5 LF	92	93	98	89	87	84
2	(Fenoxaprop + safener) + Agri-Dex + bentazon	0.08 1% 1.5	4-5 LF 4-5 LF 4-5 LF	93	92	98	98	98	97
3	(Fenoxaprop + safener) + Agri-Dex + acifluorfen	0.08 1% 1.0	4-5 LF 4-5 LF 4-5 LF	94	93	98	98	93	98
4	(Fenoxaprop + safener) + Agri-Dex + triclopyr	0.08 1% 0.38	4-5 LF 4-5 LF 4-5 LF	93	91	97	98	98	90
5	(Fenoxaprop + safener) + Agri-Dex + bensulfuron	0.08 1% 0.063	4-5 LF 4-5 LF 4-5 LF	90	91	96	98	92	89
6	(Fenoxaprop + safener) + Agri-Dex + halosulfuron	0.08 1% 0.063	4-5 LF 4-5 LF 4-5 LF	90	93	98	98	91	89
7	(Fenoxaprop + safener) + Agri-Dex + carfentrazone	0.08 1% 0.02	4-5 LF 4-5 LF 4-5 LF	95	93	95	98	94	96
8	(Fenoxaprop + safener) + Agri-Dex + propanil	0.08 1% 4.0	4-5 LF 4-5 LF 4-5 LF	94	93	98	91	69	79
9	(Fenoxaprop + safener) + Agri-Dex +	0.08 1%	4-5 LF 4-5 LF	96	94	98	98	95	98
10	Cyhalofop + Agri-Dex + (acifluorfen + bentazon)	0.25 2.5% 1.5	4-5 LF 4-5 LF 4-5 LF	90	91	98	89	89	89
11	Cyhalofop + Agri-Dex + bentazon	0.25 2.5% 1.5	4-5 LF 4-5 LF 4-5 LF	84	84	94	86	87	63
12	Cyhalofop + Agri-Dex + acifluorfen	0.25 2.5% 1.0	4-5 LF 4-5 LF 4-5 LF	83	86	93	72	96	92
13	Cyhalofop + Agri-Dex + triclopyr	0.25 2.5% 0.38	4-5 LF 4-5 LF 4-5 LF	58	70	79	58	68	63
14	Cyhalofop + Agri-Dex + bensulfuron	0.25 2.5% 0.063	4-5 LF 4-5 LF 4-5 LF	54	68	78	82	77	69
15	Cyhalofop + Agri-Dex + halosulfuron	0.25 2.5% 0.063	4-5 LF 4-5 LF 4-5 LF	48	63	71	60	56	53
16	Cyhalofop + Agri-Dex + carfentrazone	0.25 2.5% 0.02	4-5 LF 4-5 LF 4-5 LF	75	80	83	98	68	60

continued

Table 2. Section 2. Continued.

				Weed control					
				Broadleaf signalgrass (BRAPP)				Amazon sprangletop (LEFPA)	
	Herbicide	Rate	Application timing	6/8	6/28	7/18	8/16	7/18	8/16
		(lb ai/A)		(%)					
17	Cyhalofop +	0.25	4-5 LF	93	90	92	98	95	88
	Agri-Dex +	2.5%	4-5 LF						
	propanil	4.0	4-5 LF						
18	Cyhalofop +	0.25	4-5 LF	74	81	86	98	89	73
	Agri-Dex	2.5%	4-5 LF						
19	Clefoxydim +	0.089	4-5 LF	38	60	71	57	84	81
	Agri-Dex +	1%	4-5 LF						
	(acifluorfen + bentazon)	1.5	4-5 LF						
20	Clefoxydim +	0.089	4-5 LF	56	71	78	40	50	60
	Agri-Dex +	1%	4-5 LF						
	bentazon	1.5	4-5 LF						
21	Clefoxydim +	0.089	4-5 LF	76	80	86	59	98	98
	Agri-Dex +	1%	4-5 LF						
	acifluorfen	1.0	4-5 LF						
22	Clefoxydim +	0.089	4-5 LF	56	65	74	40	87	75
	Agri-Dex +	1%	4-5 LF						
	triclopyr	0.38	4-5 LF						
23	Clefoxydim +	0.089	4-5 LF	76	85	93	93	98	86
	Agri-Dex +	1%	4-5 LF						
	bensulfuron	0.063	4-5 LF						
24	Clefoxydim +	0.089	4-5 LF	68	75	83	94	94	81
	Agri-Dex +	1%	4-5 LF						
	halosulfuron	0.063	4-5 LF						
25	Clefoxydim +	0.089	4-5 LF	70	80	87	57	93	79
	Agri-Dex +	1%	4-5 LF						
	carfentrazone	0.02	4-5 LF						
26	Clefoxydim +	0.089	4-5 LF	63	81	90	81	53	78
	Agri-Dex +	1%	4-5 LF						
	propanil	4.0	4-5 LF						
27	Clefoxydim +	0.089	4-5 LF	76	80	83	89	98	96
	Agri-Dex	1%	4-5 LF						
28	Untreated			0	0	0	0	0	0
	LSD (0.05)			14	9	8	23	17	27

continued

Table 2. Section 3.

	Herbicide	Rate	Application timing	Effect on rice: Injury 6/8	Injury 6/28	Injury 7/18	Injury 8/16	Yield 9/20
		(lb ai/A)		---------- (%) ----------				(lb/A)
1	(Fenoxaprop + safener) +	0.08	4-5LF	13	9	0	0	5156
	Agri-Dex +	1%	4-5 LF					
	(acifluorfen + bentazon)	1.5	4-5 LF					
2	(Fenoxaprop + safener) +	0.08	4-5 LF	9	6	0	0	6217
	Agri-Dex +	1%	4-5 LF					
	bentazon	1.5	4-5 LF					
3	(Fenoxaprop + safener) +	0.08	4-5 LF	20	15	0	0	6086
	Agri-Dex +	1%	4-5 LF					
	acifluorfen	1.0	4-5 LF					
4	(Fenoxaprop + safener) +	0.08	4-5 LF	16	14	0	0	7449
	Agri-Dex +	1%	4-5 LF					
	triclopyr	0.38	4-5 LF					
5	(Fenoxaprop + safener) +	0.08	4-5 LF	9	6	0	0	6281
	Agri-Dex +	1%	4-5 LF					
	bensulfuron	0.063	4-5 LF					
6	(Fenoxaprop + safener) +	0.08	4-5 LF	13	11	0	0	4107
	Agri-Dex +	1%	4-5 LF					
	halosulfuron	0.063	4-5 LF					
7	(Fenoxaprop + safener) +	0.08	4-5 LF	14	10	0	0	7018
	Agri-Dex +	1%	4-5 LF					
	carfentrazone	0.02	4-5 LF					
8	(Fenoxaprop + safener) +	0.08	4-5 LF	4	4	0	0	1744
	Agri-Dex +	1%	4-5 LF					
	propanil	4.0	4-5 LF					
9	(Fenoxaprop + safener) +	0.08	4-5 LF	15	10	0	0	3317
	Agri-Dex +	1%	4-5 LF					
10	Cyhalofop +	0.25	4-5 LF	16	13	0	0	2820
	Agri-Dex +	2.5%	4-5 LF					
	(acifluorfen + bentazon)	1.5	4-5 LF					
11	Cyhalofop +	0.25	4-5 LF	11	10	0	0	3950
	Agri-Dex +	2.5%	4-5 LF					
	bentazon	1.5	4-5 LF					
12	Cyhalofop +	0.25	4-5 LF	21	16	0	0	4920
	Agri-Dex +	2.5%	4-5 LF					
	acifluorfen	1	4-5 LF					
13	Cyhalofop +	0.25	4-5 LF	23	18	0	0	4149
	Agri-Dex +	2.5%	4-5 LF					
	triclopyr	0.38	4-5 LF					
14	Cyhalofop +	0.25	4-5 LF	9	6	0	0	4396
	Agri-Dex +	2.5%	4-5 LF					
	bensulfuron	0.063	4-5 LF					
15	Cyhalofop +	0.25	4-5 LF	5	4	0	0	2412
	Agri-Dex +	2.5%	4-5 LF					
	halosulfuron	0.063	4-5 LF					
16	Cyhalofop +	0.25	4-5 LF	11	10	0	0	3435
	Agri-Dex +	2.5%	4-5 LF					
	carfentrazone	0.02	4-5 LF					

continued

Table 2. Section 3. Continued.

	Herbicide	Rate	Application timing	Effect on rice: Injury 6/8	Injury 6/28	Injury 7/18	Injury 8/16	Yield 9/20
		(lb ai/A)		---------- (%) ----------				(lb/A)
17	Cyhalofop +	0.25	4-5 LF	8	5	0	0	2348
	Agri-Dex +	2.5%	4-5 LF					
	propanil	4.0	4-5 LF					
18	Cyhalofop +	0.25	4-5 LF	13	9	0	0	3545
	Agri-Dex	2.5%	4-5 LF					
19	Clefoxydim +	0.089	4-5 LF	18	13	0	0	2093
	Agri-Dex +	1%	4-5 LF					
	(acifluorfen + bentazon)	1.5	4-5 LF					
20	Clefoxydim +	0.089	4-5 LF	4	4	0	0	1155
	Agri-Dex +	1%	4-5 LF					
	bentazon	1.5	4-5 LF					
21	Clefoxydim +	0.089	4-5 LF	19	16	0	0	5844
	Agri-Dex +	1%	4-5 LF					
	acifluorfen	1.0	4-5 LF					
22	Clefoxydim +	0.089	4-5 LF	19	14	0	0	5093
	Agri-Dex +	1%	4-5 LF					
	triclopyr	0.38	4-5 LF					
23	Clefoxydim +	0.089	4-5 LF	18	14	0	0	6216
	Agri-Dex +	1%	4-5 LF					
	bensulfuron	0.063	4-5 LF					
24	Clefoxydim +	0.089	4-5 LF	19	14	0	0	6799
	Agri-Dex +	1%	4-5 LF					
	halosulfuron	0.063	4-5 LF					
25	Clefoxydim +	0.089	4-5 LF	19	14	0	0	6260
	Agri-Dex +	1%	4-5 LF					
	carfentrazone	0.02	4-5 LF					
26	Clefoxydim +	0.089	4-5 LF	4	3	0	0	1212
	Agri-Dex +	1%	4-5 LF					
	propanil	4.0	4-5 LF					
27	Clefoxydim +	0.089	4-5 LF	14	9	0	0	4972
	Agri-Dex	1%	4-5 LF					
28	Untreated			0	0	0	0	835
	LSD (0.05)			8	7	0	0	2434

Table 3. Use of graminicides in herbicide programs, Stuttgart, 2000.

SUMMARY

Fenoxaprop + safener (Ricestar), cyhalofop-butyl (Clincher), and clefoxydim (Aura) were evaluated at various rates as single and sequential applications at 2- to 3-leaf and 3- to 4-leaf grass stages. Each graminicide was also evaluated in a program approach with propanil (Stam M-4), acifluorfen + bentazon (Storm), quinclorac (Facet), or bensulfuron (Londax) each applied at labeled rates.

Sequential applications of the graminicides provided more effective control of broadleaf signalgrass, propanil-resistant and -susceptible barnyardgrass, and Amazon sprangletop than a single application. These graminicides also were effective in a postemergence programs with recommended rice herbicides.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 7.3
Planting date ..... May 17, 2000
Harvest date ..... September 20, 2000
Crop / Variety ..... rice / Bengal
Dates of flushing ..... May 25 and 30, June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: 2-3 LF = 2- to 3-leaf rice; 3-4 LF = 3- to 4-leaf rice; and PREFL = preflood.

Application type	2-3 LF	3-4 LF	PREFL
Date applied	June 2, 2000	June 6, 2000	June 18, 2000
Time	11:00 am	5:45 pm	7:30 pm
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	91 / 82	77 / 78	81 / 78
Relative humidity (%)	59	52	79
Wind (mph)	2	4	3
Cloud cover (%)	15	0	70
Soil moisture	saturated	moist	saturated
Crop stage/Height	2 lf / 6"	3 lf / 8"	4 lf / 11"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015
Boom ht / # Noz / Spacing (in.)	17 / 3 / 18	17 / 3 / 18	25 / 3 / 18
Gpa / Psi	10 / 23	10 / 23	10 / 20
Weed species (density)	----------	[# leaves/height (in.)]	----------
R-ECHCG (26/ft in row)	2 lf / 1.5"	3 lf / 3.5"	5 lf / 10"
S-ECHCG (18/ft in row)	1 lf / 0.5"	3 lf / 3"	4 lf / 7"
N-ECHCG (7/ft^2)	3 lf / 1"	4 lf / 4"	8 lf / 12"
BRAPP (23/ft in row)	1 lf / 1"	3 lf / 1"	6 lf / 5"
LEFPA (2.5/ft^2)	N/A	3 lf / 1"	5 lf / 5"

Table 3. Section 1.

	Herbicide	Rate	Application timing	Barnyardgrass control: Resistant (R-ECHCG) 6/9	6/15	6/28	7/18	8/16	Susceptible (S-ECHCG) 6/9	6/15	6/28	7/18	8/16
		(lb ai/A)		(%)									
1	Clefoxydim (2000 form.) + Agri-Dex	0.065 1%	2-3 LF 2-3 LF	93	98	94	98	89	91	98	96	86	85
2	Clefoxydim (2000 form.) + quinclorac + Agri-Dex	0.065 0.25 1%	2-3 LF 2-3 LF 2-3 LF	90	98	98	98	98	91	98	98	92	92
3	Clefoxydim (2000 form.) + Agri-Dex	0.091 1%	3-4 LF 3-4 LF	0	97	96	96	93	0	98	95	86	81
4	Clefoxydim (2000 form.) + bensulfuron + Agri-Dex	0.091 0.038 1%	3-4 LF 3-4 LF 3-4 LF	0	98	97	98	88	0	98	96	90	83
5	(Fenoxaprop + safener) + Agri-Dex	0.04 1%	2-3 LF 2-3 LF	91	98	98	96	85	93	98	98	85	77
6	(Fenoxaprop + safener) + Agri-Dex	0.06 1%	3-4 LF 3-4 LF	0	97	95	98	94	0	98	86	89	84
7	(Fenoxaprop + safener) *fb* (fenoxaprop + safener)	0.05 0.067	2-3 LF PREFL	93	98	98	98	98	93	98	98	98	98
8	(Propanil + molinate) *fb* (fenoxaprop + safener)	6.0 0.067	2-3 LF PREFL	66	40	85	98	96	66	95	88	92	95
9	Propanil *fb* (fenoxaprop + safener)	4.0 0.067	2-3 LF PREFL	65	40	75	98	96	69	95	86	88	89
10	Quinclorac + Agri-Dex *fb* (fenoxaprop + safener)	0.375 1% 0.067	2-3 LF 2-3 LF PREFL	81	98	98	98	98	85	98	98	92	98
11	Propanil *fb* (fenoxaprop + safener) + (acifluorfen + bentazon)	4.0 0.067 0.75	2-3 LF PREFL PREFL	65	15	78	58	83	68	95	85	86	81
12	Cyhalofop + Agri-Dex *fb* cyhalofop + Agri-Dex	0.25 2.5% 0.25 2.5%	2-3 LF 2-3 LF PREFL PREFL	84	97	98	98	98	86	97	98	98	98
13	Clefoxydim (2000 form.) + Agri-Dex *fb* clefoxydim (2000 form.) + Agri-Dex	0.0625 1% 0.0625 1%	2-3 LF 2-3 LF PREFL PREFL	90	98	98	98	98	90	98	98	98	98
14	Clefoxydim (1999 form.) + Agri-Dex	0.065 1%	2-3 LF 2-3 LF	95	98	98	98	91	94	98	87	84	86
15	Clefoxydim (1999 form.) + Agri-Dex	0.091 1%	3-4 LF 3-4 LF	0	97	96	98	81	0	97	94	88	74
16	Untreated			0	0	0	0	0	0	0	0	0	0
	LSD (0.05)			7	20	7	8	10	7	4	8	5	11

continued

Table 3. Section 2.

				Weed control						
				Broadleaf signalgrass (BRAPP)					Rice flatsedge (CYPIR)	Eclipta (ECLAL)
	Herbicide	Rate	Application timing	6/9	6/15	6/28	7/18	8/16	7/18	8/16
		(lb ai/A)		---------- (%) ----------						
1	Clefoxydim (2000 form.) + Agri-Dex	0.065 1%	2-3 LF 2-3 LF	88	97	92	98	98	0	0
2	Clefoxydim (2000 form.) + quinclorac + Agri-Dex	0.065 0.25 1%	2-3 LF 2-3 LF 2-3 LF	88	98	98	98	98	96	96
3	Clefoxydim (2000 form.) + Agri-Dex	0.091 1%	3-4 LF 3-4 LF	0	95	96	98	85	0	0
4	Clefoxydim (2000 form.) + bensulfuron + Agri-Dex	0.091 0.038 1%	3-4 LF 3-4 LF 3-4 LF	0	96	96	98	85	98	98
5	(Fenoxaprop + safener) + Agri-Dex	0.04 1%	2-3 LF 2-3 LF	91	98	98	98	91	0	0
6	(Fenoxaprop + safener) + Agri-Dex	0.06 1%	3-4 LF 3-4 LF	0	97	98	98	98	0	25
7	(Fenoxaprop + safener) *fb* (fenoxaprop + safener)	0.05 0.067	2-3 LF PREFL	93	98	98	98	98	0	0
8	(Propanil + molinate) *fb* (fenoxaprop + safener)	6.0 0.067	2-3 LF PREFL	81	95	98	98	98	98	98
9	Propanil *fb* (fenoxaprop + safener)	4.0 0.067	2-3 LF PREFL	81	93	98	98	98	96	98
10	Quinclorac + Agri-Dex *fb* (fenoxaprop + safener)	0.375 1% 0.067	2-3 LF 2-3 LF PREFL	84	98	98	98	98	98	98
11	Propanil *fb* (fenoxaprop + safener) + (acifluorfen + bentazon)	4.0 0.067 0.75	2-3 LF PREFL PREFL	86	97	97	98	98	98	98
12	Cyhalofop + Agri-Dex *fb* cyhalofop + Agri-Dex	0.25 2.5% 0.25 2.5%	2-3 LF 2-3 LF PREFL PREFL	91	97	98	98	98	0	0
13	Clefoxydim (2000 form.) + Agri-Dex *fb* clefoxydim (2000 form.) + Agri-Dex	0.0625 1% 0.0625 1%	2-3 LF 2-3 LF PREFL PREFL	74	97	98	98	98	98	62
14	Clefoxydim (1999 form.) + Agri-Dex	0.065 1%	2-3 LF 2-3 LF	91	97	98	98	78	0	0
15	Clefoxydim (1999 form.) + Agri-Dex	0.091 1%	3-4 LF 3-4 LF	0	95	92	98	73	0	0
16	Untreated			0	0	0	0	0	0	0
	LSD (0.05)			9	3	4	0	12	2	14

continued

Table 3. Section 3.

				Amazon sprangletop (LEFPA) control		Effect on rice: Injury					Yield
	Herbicide	Rate	Application timing	7/18	8/16	6/9	6/15	6/28	7/18	8/16	9/20
		(lb ai/A)		---------- (%) ----------							(lb/A)
1	Clefoxydim (2000 form.) +	0.065	2-3 LF	98	95	1	0	3	0	0	2736
	Agri-Dex	1%	2-3 LF								
2	Clefoxydim (2000 form.) +	0.065	2-3 LF	98	81	3	0	5	0	0	8115
	quinclorac +	0.25	2-3 LF								
	Agri-Dex	1%	2-3 LF								
3	Clefoxydim (2000 form.) +	0.091	3-4 LF	98	85	0	1	8	0	0	6269
	Agri-Dex	1%	3-4 LF								
4	Clefoxydim (2000 form.) +	0.091	3-4 LF	98	91	0	0	0	0	0	5279
	bensulfuron +	0.038	3-4 LF								
	Agri-Dex	1%	3-4 LF								
5	(Fenoxaprop + safener) +	0.04	2-3 LF	98	77	9	9	16	0	0	3692
	Agri-Dex	1%	2-3 LF								
6	(Fenoxaprop + safener) +	0.06	3-4 LF	98	96	0	0	3	0	0	3574
	Agri-Dex	1%	3-4 LF								
7	(Fenoxaprop + safener) *fb*	0.05	2-3 LF	98	98	8	9	18	0	0	5105
	(fenoxaprop + safener)	0.067	PREFL								
8	(Propanil + molinate) *fb*	6.0	2-3 LF	98	94	4	1	5	0	0	9012
	(fenoxaprop + safener)	0.067	PREFL								
9	Propanil *fb*	4.0	2-3 LF	98	94	3	0	0	0	0	7281
	(fenoxaprop + safener)	0.067	PREFL								
10	Quinclorac +	0.375	2-3 LF	96	81	0	1	0	0	0	8497
	Agri-Dex *fb*	1%	2-3 LF								
	(fenoxaprop + safener)	0.067	PREFL								
11	Propanil *fb*	4.0	2-3 LF	98	98	3	1	25	0	0	7671
	(fenoxaprop + safener) +	0.067	PREFL								
	(acifluorfen + bentazon)	0.75	PREFL								
12	Cyhalofop +	0.25	2-3 LF	98	98	3	0	0	0	0	3827
	Agri-Dex *fb*	2.5%	2-3 LF								
	cyhalofop +	0.25	PREFL								
	Agri-Dex	2.5%	PREFL								
13	Clefoxydim (2000 form.) +	0.0625	2-3 LF	98	98	0	1	11	0	0	7778
	Agri-Dex *fb*	1%	2-3 LF								
	clefoxydim (2000 form.)	0.0625	PREFL								
	+ Agri-Dex	1%	PREFL								
14	Clefoxydim (1999 form.) +	0.065	2-3 LF	98	90	4	0	6	0	0	2323
	Agri-Dex	1%	2-3 LF								
15	Clefoxydim (1999 form.) +	0.091	3-4 LF	98	76	0	0	6	0	0	2318
	Agri-Dex	1%	3-4 LF								
16	Untreated			0	0	0	0	0	0	0	1126
	LSD (0.05)			1	15	7	3	7	0	0	2825

Table 4. Cyhalofop-butyl in herbicide programs for broad-spectrum weed control, Stuttgart, 2000.

SUMMARY

Cyhalofop-butyl was evaluated in a herbicide program approach with clomazone (Command), quinclorac (Facet), propanil (Stam M-4), and triclopyr (Grandstand). Herbicide treatments were applied at 2- to 3-leaf and 4- to 6-leaf grass stages. Cyhalofop-butyl was applied at 0.188 lb ai/A, and all other herbicides were applied at labeled rates.

All of the treatments evaluated provided effective control of propanil-resistant and -susceptible barnyardgrass at the end of the season, except for those programs that relied only upon propanil for grass control. Sequential applications of cyhalofop-butyl were necessary for adequate control of barnyardgrass and broadleaf signalgrass. Broadleaf weed control, >86% at the end of the season, was attained with all treatments containing quinclorac, propanil, or triclopyr.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 7.3
Planting date ..... May 17, 2000
Harvest date ..... September 20, 2000
Crop / Variety ..... rice / Bengal
Dates of flushing ..... May 25 and 30, June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: PRE = preemergence; 2-3 LF = 2- to 3-leaf rice; PREFL = preflood; and POFL = Postflood.

Application type	PRE	2-3 LF	PREFL	POFL
Date applied	May 18, 2000	June 2, 2000	June 18, 2000	July 5, 2000
Time	7:00 pm	2:30 pm	8:00 am	2:00 pm
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	86 / 78	95 / 92	78 / 79	95 / 88
Relative humidity (%)	55	41	92	89
Wind (mph)	7	2	3	2
Cloud cover (%)	75	15	100	30
Soil moisture	dry	saturated	flooded	flooded
Crop stage/Height	N/A	2 lf / 6"	4 lf / 11"	7-8 lf / 18"
Sprayer type/mph	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 11001
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	17 / 3 / 18	28 / 3 / 18	16 / 3 / 18
Gpa / Psi	10 / 30	10 / 22	10 / 20	10 / 30
Weed species (density)	---------- [# leaves/height (in.)] ----------			
R-ECHCG (17/ft in row)	N/A	2 lf / 2"	5 lf / 5"	7-8 lf / 13-15"
S-ECHCG (9/ft in row)	N/A	2 lf / 1.5"	4 lf / 4"	6-7 lf / 13-14"
N-ECHCG (7/ft^2)	N/A	3 lf / 2"	10 lf / 11'	
BRAPP (20/ft in row)	N/A	2 lf / 1"	4 lf / 3"	15+ lf / 9-11"
PHBPU (17.5/ft in row)	N/A	1 lf / 1.5"	5 lf / 3'	10-12 lf / 9-11"
AESVI (6/ft in row)	N/A	2 lf / 2"	N/A	10-12 lf / 9-11"
SEBEX (42/ft in row)	N/A	2 lf / 4"	N/A	11-13 lf / 15-18"

Table 4. Section 1.

				Barnyardgrass control									
			Application	Resistant (R-ECHCG)					Susceptible (S-ECHCG)				
	Herbicide	Rate	timing	6/9	6/15	6/28	7/18	8/16	6/9	6/15	6/28	7/18	8/16
		(lb ai/A)		(%)									
1	Cyhalofop +	0.187	2-3 LF	74	91	98	98	98	75	69	98	91	96
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
2	Cyhalofop +	0.187	2-3 LF	75	91	98	96	96	75	71	97	90	94
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	propanil	1.0	PREFL										
3	Cyhalofop +	0.187	2-3 LF	80	94	98	98	98	78	91	98	96	98
	pendimethalin +	1.0	2-3 LF										
	Agri-Dex *fb*	2.5%	2-3 LF										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
4	Cyhalofop +	0.187	2-3 LF	83	95	98	98	98	80	94	98	98	98
	pendimethalin +	1.0	2-3 LF										
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
5	Quinclorac +	0.375	2-3 LF	80	94	98	98	98	80	93	97	90	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
6	Propanil *fb*	4.0	2-3 LF	68	61	87	85	92	74	63	81	80	84
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
7	Propanil +	1.0	2-3 LF	74	88	98	98	98	78	89	96	96	98
	pendimethalin *fb*	1.0	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
8	Cyhalofop +	0.187	2-3 LF	80	86	98	98	98	80	76	96	91	91
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	carfentrazone +	0.025	PREFL										
	Agri-Dex	1.25%	PREFL										
9	Cyhalofop +	0.187	2-3 LF	84	71	98	98	98	85	69	98	96	92
	propanil *fb*	2.0	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
10	Cyhalofop +	0.187	2-3 LF	83	86	98	98	98	81	76	98	96	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	propanil +	4.0	PREFL										
	triclopyr	0.25	PREFL										

continued

Table 4. Section 1. Continued.

				Barnyardgrass control									
			Application	Resistant (R-ECHCG)					Susceptible (S-ECHCG)				
	Herbicide	Rate	timing	6/9	6/15	6/28	7/18	8/16	6/9	6/15	6/28	7/18	8/16
		(lb ai/A)		---------- (%) ----------									
11	Propanil *fb* propanil + triclopyr	4.0 4.0 0.25	2-3 LF PREFL PREFL	68	55	58	40	50	68	59	60	71	64
12	Propanil + quinclorac	4.0 0.375	2-3 LF 2-3 LF	93	95	98	98	98	93	95	98	96	98
13	(Fenoxaprop + safener) *fb* (fenoxaprop + safener) + triclopyr	0.045 0.045 0.25	2-3 LF PREFL PREFL	86	91	98	98	98	86	90	98	92	96
14	Cyhalofop + Agri-Dex *fb* cyhalofop + triclopyr + Agri-Dex	0.187 2.5% 0.187 0.375 1.25%	2-3 LF 2-3 LF PREFL PREFL PREFL	86	90	98	98	98	84	68	98	96	98
15	Clomazone *fb* cyhalofop + triclopyr + Agri-Dex	0.4 0.187 0.375 1.25%	PRE PREFL PREFL PREFL	95	95	98	98	98	95	95	98	98	98
16	Clomazone *fb* triclopyr + Agri-Dex	0.4 0.375 1.25%	PRE PREFL PREFL	95	95	98	98	98	95	95	98	98	98
17	Clomazone + cyhalofop + Agri-Dex	0.4 0.187 2.5%	2-3 LF 2-3 LF 2-3 LF	84	95	98	98	98	85	95	98	98	98
18	Cyhalofop + triclopyr + Agri-Dex	0.187 0.25 1.25%	2-3 LF 2-3 LF 2-3 LF	85	94	98	96	98	81	90	88	85	92
19	Cyhalofop + carfentrazone + Agri-Dex	0.187 0.025 1.25%	2-3 LF 2-3 LF 2-3 LF	81	83	95	92	87	83	75	82	74	75
20	Cyhalofop + propanil + Agri-Dex	0.187 4.0 1.25%	2-3 LF 2-3 LF 2-3 LF	85	70	92	76	68	88	69	74	69	63
21	Cyhalofop + Agri-Dex	0.187 2.5%	2-3 LF 2-3 LF	86	81	92	90	89	85	74	68	65	74
22	Propanil *fb* cyhalofop + Agri-Dex	4.0 0.187 2.5%	PREFL POFL POFL	0	0	50	81	95	0	0	53	81	88
23	Untreated			0	0	0	0	0	0	0	0	0	0
	LSD (0.05)			8	9	8	8	9	9	11	12	7	7

continued

Table 4. Section 2.

				Weed control									
				Broadleaf signalgrass (BRAPP)					Hemp sesbania (SEBEX)				
	Herbicide	Rate	Application timing	6/9	6/15	6/28	7/18	8/16	6/9	6/15	6/28	7/18	8/16
		(lb ai/A)		(%)									
1	Cyhalofop +	0.187	2-3 LF	78	70	98	98	91	0	0	74	76	86
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
2	Cyhalofop +	0.187	2-3 LF	78	71	98	98	98	0	0	98	98	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	propanil	1.0	PREFL										
3	Cyhalofop +	0.187	2-3 LF	89	85	98	98	98	0	0	73	80	90
	pendimethalin +	1.0	2-3 LF										
	Agri-Dex *fb*	2.5%	2-3 LF										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
4	Cyhalofop +	0.187	2-3 LF	81	91	98	98	98	0	0	79	98	98
	pendimethalin +	1.0	2-3 LF										
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
5	Quinclorac +	0.375	2-3 LF	86	93	98	98	98	70	89	98	98	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
6	Propanil *fb*	4.0	2-3 LF	81	74	98	98	98	94	91	97	98	98
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
7	Propanil +	1.0	2-3 LF	83	84	98	98	97	95	91	98	94	97
	pendimethalin *fb*	1.0	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
8	Cyhalofop +	0.187	2-3 LF	84	75	98	98	98	0	0	98	96	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	carfentrazone +	0.025	PREFL										
	Agri-Dex	1.25%	PREFL										
9	Cyhalofop +	0.187	2-3 LF	90	79	98	98	98	95	94	98	96	96
	propanil *fb*	2.0	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
10	Cyhalofop +	0.187	2-3 LF	85	81	98	98	98	10	0	98	98	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	propanil +	4.0	PREFL										
	triclopyr	0.25	PREFL										

continued

Table 4. Section 2. Continued.

				Weed control									
			Application	Broadleaf signalgrass (BRAPP)					Hemp sesbania (SEBEX)				
	Herbicide	Rate	timing	6/9	6/15	6/28	7/18	8/16	6/9	6/15	6/28	7/18	8/16
		(lb ai/A)		---------- (%) ----------									
11	Propanil *fb* propanil + triclopyr	4.0 4.0 0.25	2-3 LF PREFL PREFL	81	69	98	98	98	95	93	98	98	98
12	Propanil + quinclorac	4.0 0.375	2-3 LF 2-3 LF	95	95	98	98	98	95	95	98	98	98
13	(Fenoxaprop + safener) *fb* (fenoxaprop + safener) + triclopyr	0.045 0.045 0.25	2-3 LF PREFL PREFL	90	93	98	98	98	10	0	75	81	88
14	Cyhalofop + Agri-Dex *fb* cyhalofop + triclopyr + Agri-Dex	0.187 2.5% 0.187 0.375 1.25%	2-3 LF 2-3 LF PREFL PREFL PREFL	88	76	98	98	98	0	0	81	96	98
15	Clomazone *fb* cyhalofop + triclopyr + Agri-Dex	0.4 0.187 0.375 1.25%	PRE PREFL PREFL PREFL	94	95	98	98	98	0	0	78	92	96
16	Clomazone *fb* triclopyr + Agri-Dex	0.4 0.375 1.25%	PRE PREFL PREFL	95	95	98	98	98	0	15	71	89	93
17	Clomazone + cyhalofop + Agri-Dex	0.4 0.187 2.5%	2-3 LF 2-3 LF 2-3 LF	88	95	98	98	98	48	33	0	0	15
18	Cyhalofop + triclopyr + Agri-Dex	0.187 0.25 1.25%	2-3 LF 2-3 LF 2-3 LF	79	81	98	98	98	63	71	71	70	69
19	Cyhalofop + carfentrazone + Agri-Dex	0.187 0.025 1.25%	2-3 LF 2-3 LF 2-3 LF	83	76	95	98	98	95	95	86	73	86
20	Cyhalofop + propanil + Agri-Dex	0.187 4.0 1.25%	2-3 LF 2-3 LF 2-3 LF	86	80	98	98	89	94	91	74	83	84
21	Cyhalofop + Agri-Dex	0.187 2.5%	2-3 LF 2-3 LF	89	71	94	98	82	0	0	0	0	0
22	Propanil *fb* cyhalofop + Agri-Dex	4.0 0.187 2.5%	PREFL POFL POFL	0	0	98	98	98	0	0	98	98	98
23	Untreated			0	0	0	0	0	0	0	0	0	0
	LSD (0.05)			9	12	3	0	9	10	15	7	9	12

continued

Table 4. Section 3.

	Herbicide	Rate	Application timing	Weed control: Northern jointvetch (AESVI) 6/9	6/15	6/28	7/18	8/16	Tall morningglory (PHBPU) 6/9	6/15	6/28	7/18	8/16
		(lb ai/A)		(%)									
1	Cyhalofop +	0.187	2-3 LF	10	0	98	98	95	0	10	89	98	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
2	Cyhalofop +	0.187	2-3 LF	0	0	98	98	98	0	0	91	98	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	propanil	1.0	PREFL										
3	Cyhalofop +	0.187	2-3 LF	23	64	98	96	98	0	30	98	98	98
	pendimethalin +	1.0	2-3 LF										
	Agri-Dex *fb*	2.5%	2-3 LF										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
4	Cyhalofop +	0.187	2-3 LF	19	63	98	98	98	0	40	98	98	98
	pendimethalin +	1.0	2-3 LF										
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
5	Quinclorac +	0.375	2-3 LF	70	95	98	98	98	66	95	98	98	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
6	Propanil *fb*	4.0	2-3 LF	94	79	98	96	96	65	43	98	98	98
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
7	Propanil +	1.0	2-3 LF	94	91	98	98	98	70	68	98	98	98
	pendimethalin *fb*	1.0	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
8	Cyhalofop +	0.187	2-3 LF	23	20	98	98	77	0	20	96	98	86
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	carfentrazone +	0.025	PREFL										
	Agri-Dex	1.25%	PREFL										
9	Cyhalofop +	0.187	2-3 LF	91	50	98	98	98	40	10	98	98	98
	propanil *fb*	2.0	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
10	Cyhalofop +	0.187	2-3 LF	21	0	98	98	98	0	0	98	98	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	propanil +	4.0	PREFL										
	triclopyr	0.25	PREFL										

continued

Table 4. Section 3.

	Herbicide	Rate	Application timing	Weed control: Northern jointvetch (AESVI) 6/9	6/15	6/28	7/18	8/16	Tall morningglory (PHBPU) 6/9	6/15	6/28	7/18	8/16
		(lb ai/A)		(%)									
1	Cyhalofop +	0.187	2-3 LF	10	0	98	98	95	0	10	89	98	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
2	Cyhalofop +	0.187	2-3 LF	0	0	98	98	98	0	0	91	98	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	propanil	1.0	PREFL										
3	Cyhalofop +	0.187	2-3 LF	23	64	98	96	98	0	30	98	98	98
	pendimethalin +	1.0	2-3 LF										
	Agri-Dex *fb*	2.5%	2-3 LF										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
4	Cyhalofop +	0.187	2-3 LF	19	63	98	98	98	0	40	98	98	98
	pendimethalin +	1.0	2-3 LF										
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
5	Quinclorac +	0.375	2-3 LF	70	95	98	98	98	66	95	98	98	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
6	Propanil *fb*	4.0	2-3 LF	94	79	98	96	96	65	43	98	98	98
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
7	Propanil +	1.0	2-3 LF	94	91	98	98	98	70	68	98	98	98
	pendimethalin *fb*	1.0	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
8	Cyhalofop +	0.187	2-3 LF	23	20	98	98	77	0	20	96	98	86
	Agri-Dex *fb*	2.5%	2-3 LF										
	cyhalofop +	0.187	PREFL										
	carfentrazone +	0.025	PREFL										
	Agri-Dex	1.25%	PREFL										
9	Cyhalofop +	0.187	2-3 LF	91	50	98	98	98	40	10	98	98	98
	propanil *fb*	2.0	2-3 LF										
	cyhalofop +	0.187	PREFL										
	triclopyr +	0.25	PREFL										
	Agri-Dex	1.25%	PREFL										
10	Cyhalofop +	0.187	2-3 LF	21	0	98	98	98	0	0	98	98	98
	Agri-Dex *fb*	2.5%	2-3 LF										
	propanil +	4.0	PREFL										
	triclopyr	0.25	PREFL										

continued

Table 4. Section 4.

				Amazon sprangletop	Effect on rice					
			Application	(LEFPA) control	Injury					Yield
	Herbicide	Rate	timing	8/16	6/9	6/15	6/28	7/18	8/16	9/21
		(lb ai/A)		---------- (%) ----------						(lb/A)
1	Cyhalofop +	0.187	2-3 LF	94	0	0	15	0	0	8626
	Agri-Dex *fb*	2.5%	2-3 LF							
	cyhalofop +	0.187	PREFL							
	triclopyr +	0.25	PREFL							
	Agri-Dex	1.25%	PREFL							
2	Cyhalofop +	0.187	2-3 LF	98	0	0	18	0	0	9645
	Agri-Dex *fb*	2.5%	2-3 LF							
	cyhalofop +	0.187	PREFL							
	triclopyr +	0.25	PREFL							
	propanil	1.0	PREFL							
3	Cyhalofop +	0.187	2-3 LF	98	0	0	11	0	0	9405
	pendimethalin +	1.0	2-3 LF							
	Agri-Dex *fb*	2.5%	2-3 LF							
	triclopyr +	0.25	PREFL							
	Agri-Dex	1.25%	PREFL							
4	Cyhalofop +	0.187	2-3 LF	98	0	0	13	0	0	9752
	pendimethalin +	1.0	2-3 LF							
	Agri-Dex *fb*	2.5%	2-3 LF							
	cyhalofop +	0.187	PREFL							
	triclopyr +	0.25	PREFL							
	Agri-Dex	1.25%	PREFL							
5	Quinclorac +	0.375	2-3 LF	73	0	0	19	0	0	9127
	Agri-Dex *fb*	2.5%	2-3 LF							
	cyhalofop +	0.187	PREFL							
	triclopyr +	0.25	PREFL							
	Agri-Dex	1.25%	PREFL							
6	Propanil *fb*	4.0	2-3 LF	96	0	0	26	0	0	10043
	cyhalofop +	0.187	PREFL							
	triclopyr +	0.25	PREFL							
	Agri-Dex	1.25%	PREFL							
7	Propanil +	1.0	2-3 LF	98	0	0	16	0	0	9666
	pendimethalin *fb*	1.0	2-3 LF							
	cyhalofop +	0.187	PREFL							
	triclopyr +	0.25	PREFL							
	Agri-Dex	1.25%	PREFL							
8	Cyhalofop +	0.187	2-3 LF	98	0	0	14	0	0	8368
	Agri-Dex *fb*	2.5%	2-3 LF							
	cyhalofop +	0.187	PREFL							
	carfentrazone +	0.025	PREFL							
	Agri-Dex	1.25%	PREFL							
9	Cyhalofop +	0.187	2-3 LF	98	3	0	26	0	0	8140
	propanil *fb*	2.0	2-3 LF							
	cyhalofop +	0.187	PREFL							
	triclopyr +	0.25	PREFL							
	Agri-Dex	1.25%	PREFL							
10	Cyhalofop +	0.187	2-3 LF	98	3	0	19	0	0	9760
	Agri-Dex *fb*	2.5%	2-3 LF							
	propanil +	4.0	PREFL							
	triclopyr	0.25	PREFL							

continued

Table 4. Section 4. Continued.

				Amazon sprangletop	Effect on rice					
			Application	(LEFPA) control	Injury					Yield
	Herbicide	Rate	timing	8/16	6/9	6/15	6/28	7/18	8/16	9/21
		(lb ai/A)		---------- (%) ----------						(lb/A)
11	Propanil *fb* propanil + triclopyr	4.0 4.0 0.25	2-3 LF PREFL PREFL	98	0	0	20	0	0	7916
12	Propanil + quinclorac	4.0 0.375	2-3 LF 2-3 LF	98	3	3	14	3	0	8989
13	(Fenoxaprop + safener) *fb* (fenoxaprop + safener) + triclopyr	0.045 0.045 0.25	2-3 LF PREFL PREFL	98	3	0	15	0	0	9014
14	Cyhalofop + Agri-Dex *fb* cyhalofop + triclopyr + Agri-Dex	0.187 2.5% 0.187 0.375 1.25%	2-3 LF 2-3 LF PREFL PREFL PREFL	98	0	0	24	0	0	9694
15	Clomazone *fb* cyhalofop + triclopyr + Agri-Dex	0.4 0.187 0.375 1.25%	PRE PREFL PREFL PREFL	98	51	45	41	10	0	8442
16	Clomazone *fb* triclopyr + Agri-Dex	0.4 0.375 1.25%	PRE PREFL PREFL	98	48	31	41	11	0	8867
17	Clomazone + cyhalofop + Agri-Dex	0.4 0.187 2.5%	2-3 LF 2-3 LF 2-3 LF	98	16	18	15	5	0	7455
18	Cyhalofop + triclopyr + Agri-Dex	0.187 0.25 1.25%	2-3 LF 2-3 LF 2-3 LF	92	0	13	9	0	0	8304
19	Cyhalofop + carfentrazone + Agri-Dex	0.187 0.025 1.25%	2-3 LF 2-3 LF 2-3 LF	96	4	0	5	0	0	6357
20	Cyhalofop + propanil + Agri-Dex	0.187 4.0 1.25%	2-3 LF 2-3 LF 2-3 LF	92	0	0	8	0	0	5370
21	Cyhalofop + Agri-Dex	0.187 2.5%	2-3 LF 2-3 LF	89	0	0	4	0	0	4790
22	Propanil *fb* cyhalofop + Agri-Dex	4.0 0.187 2.5%	PREFL POFL POFL	98	0	0	9	0	0	9085
23	Untreated			0	0	0	0	0	0	1289
	LSD (0.05)			7	8	11	7	6	0	1385

Table 5. Herbicide combinations with halosulfuron, Stuttgart, 2000.

SUMMARY

Clomazone (Command) was applied preememergence at 0.4 lb ai/A over the entire experimental area to control grass species. Triclopyr (Grandstand) was evaluated at 0.19 and 0.25 lb ai/A in tank mixtures with halosulfuron (Permit) at 0.12, 0.23, and 0.47 lb ai/A to evaluate control of morningglory species and hemp sesbania. These treatments were applied at the 4- to 5-leaf rice stage. Bentazon (Basagran), acifluorfen (Blazer), and bentazon + acifluorfen (Storm) at labeled rates were evaluated in combination with halosulfuron at a 5- to 6-leaf rice stage, which was a preflood application timing.

When halosulfuron was tank-mixed with triclopyr, regardless of rate combination, control of pitted and tall morningglory ranged from 90 to 100%. Halosulfuron applied alone at the 4- to 5- leaf timing gave little control (<32%). However, at the 5- to 6-leaf timing, 92% control of morningglory species was obtained with halosulfuron at 0.047 lb ai/A. Bentazon gave 50 to 80% control of these morningglory species when applied alone at the 5- to 6-leaf stage, with little difference observed in control when tank-mixed with halosulfuron. All programs with acifluorfen gave >90% control of both morningglory species.

When halosulfuron was used at 0.023 or 0.047 lb ai/A alone or in combination with triclopyr at the 4- to 5-leaf timing, hemp sesbania control was >80%. When bentazon and halosulfuron were tank-mixed, hemp sesbania control was less than when halosulfuron was applied alone. When halosulfuron was used in a program with acifluorfen, hemp sesbania control was 100%.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 5.2

Planting date ..... May 17, 2000
Harvest date ..... September 21, 2000
Crop / Variety ..... rice / Wells
Dates of flushing ..... June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: MIDPOST = mid-postemergence; and PREFL = preflood.

Application type	MIDPOST	PREFL
Date applied	June 12, 2000	June 19, 2000
Time	7:00 pm	10:00 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	84 / 84	86 / 84
Relative humidity (%)	62	85
Wind (mph)	4	1
Cloud cover (%)	40	50
Soil moisture	dry	wet
Crop stage/Height	4 lf / 8"	5-6 lf / 9.5"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet DG / 110015
Boom ht / # Noz / Spacing (in.)	26 / 3 / 18	29 / 3 / 18
Gpa / Psi	10 / 25	10 / 28
Weed species (density)	---------- [# leaves/height (in.)] ----------	
SEBEX (40/ft in row)	4 lf / 8-9"	7-8 lf / 10-12"
AESVI	N/A	N/A
PHBPU (18/ft in row)	3-4 lf / 4-5"	7-8 lf / 5-6"
IPOHG (10/ft in row)	3 lf / 4"	7 lf / 4-5"
CYPIR	N/A	N/A
HETLI	N/A	N/A

Table 5. Section 1.

	Herbicide	Rate	Application timing	Weed control: Pitted morningglory (IPOLA) 6/28	7/18	8/16	Tall morningglory (PHBPU) 6/28	7/18	8/16
		(lb ai/A)		(%)					
1	Untreated			0	0	0	0	0	0
2	Triclopyr +	0.25	MPOST	89	100	100	89	100	100
	halosulfuron +	0.047	MPOST						
	AG-98	0.25%	MPOST						
3	Triclopyr +	0.25	MPOST	90	100	100	90	100	100
	halosulfuron +	0.023	MPOST						
	AG-98	0.25%	MPOST						
4	Triclopyr +	0.25	MPOST	90	100	93	90	100	93
	halosulfuron +	0.012	MPOST						
	AG-98	0.25%	MPOST						
5	Triclopyr +	0.19	MPOST	88	100	93	88	100	93
	halosulfuron +	0.047	MPOST						
	AG-98	0.25%	MPOST						
6	Triclopyr +	0.19	MPOST	91	93	94	91	83	94
	halosulfuron +	0.023	MPOST						
	AG-98	0.25%	MPOST						
7	Triclopyr +	0.19	MPOST	96	100	100	95	100	100
	halosulfuron +	0.012	MPOST						
	AG-98	0.25%	MPOST						
8	Triclopyr +	0.19	MPOST	90	100	100	90	100	100
	propanil +	2.0	MPOST						
	halosulfuron	0.047	MPOST						
9	Triclopyr +	0.19	MPOST	97	100	100	97	100	100
	propanil +	2.0	MPOST						
	halosulfuron	0.023	MPOST						
10	Triclopyr +	0.19	MPOST	91	100	100	90	100	100
	propanil	2.0	MPOST						
	halosulfuron	0.012	MPOST						
11	Triclopyr +	0.19	MPOST	93	100	100	93	100	100
	propanil	2.0	MPOST						
12	Triclopyr +	0.25	MPOST	100	100	100	100	100	100
	propanil	2.0	MPOST						
13	Halosulfuron +	0.047	MPOST	28	53	28	28	53	28
	AG-98	0.25%	MPOST						
14	Halosulfuron +	0.023	MPOST	35	40	33	35	40	33
	AG-98	0.25%	MPOST						
15	Halosulfuron +	0.012	MPOST	38	30	28	38	30	28
	AG-98	0.25%	MPOST						
16	Bentazon +	0.75	PREFL	40	65	53	40	65	53
	Agri-Dex	2.5%	PREFL						
17	Bentazon +	1.0	PREFL	53	75	79	50	65	79
	Agri-Dex	2.5%	PREFL						
18	Halosulfuron +	0.047	PREFL	53	83	94	53	83	94
	Agri-Dex	1.0%	PREFL						
19	Halosulfuron +	0.035	PREFL	51	73	68	48	73	68
	bentazon +	0.5	PREFL						
	Agri-Dex	1.0%	PREFL						
20	Halosulfuron +	0.024	PREFL	48	65	75	48	65	75
	bentazon +	0.75	PREFL						
	Agri-Dex	1.0%	PREFL						
21	Halosulfuron +	0.035	PREFL	40	90	56	40	90	56
	bentazon +	0.75	PREFL						
	Agri-Dex	1.0%	PREFL						

continued

Table 5. Section 1. Continued.

				Weed control					
				Pitted morningglory (IPOLA)			Tall morningglory (PHBPU)		
	Herbicide	Rate	Application timing	6/28	7/18	8/16	6/28	7/18	8/16
		(lb ai/A)		---------- (%) ----------					
22	Halosulfuron +	0.047	PREFL	65	100	93	65	100	93
	acifluorfen +	0.125	PREFL						
	AG-98	0.25%	PREFL						
23	Halosulfuron +	0.035	PREFL	85	93	94	86	93	94
	acifluorfen +	0.25	PREFL						
	AG-98	0.25%	PREFL						
24	Halosulfuron +	0.047	PREFL	90	100	100	90	100	100
	(acifluorfen + bentazon)	0.75	PREFL						
	+ AG-98	0.25%	PREFL						
25	Halosulfuron +	0.035	PREFL	93	100	100	93	100	100
	(acifluorfen + bentazon)	0.75	PREFL						
	+ AG-98	0.25%	PREFL						
	LSD (0.05)			18	27	24	18	29	24

continued

Table 5. Section 2.

				Hemp sesbania (SEBEX) control			Effect on rice			
							Injury			Yield
	Herbicide	Rate	Application timing	6/28	7/18	8/16	6/28	7/11	7/18	9/21
		(lb ai/A)		---------- (%) ----------						(lb/A)
1	Untreated			0	0	0	0	0	0	5576
2	Triclopyr +	0.25	MPOST	84	100	100	0	0	0	7306
	halosulfuron +	0.047	MPOST							
	AG-98	0.25%	MPOST							
3	Triclopyr +	0.25	MPOST	80	90	89	0	0	0	6737
	halosulfuron +	0.023	MPOST							
	AG-98	0.25%	MPOST							
4	Triclopyr +	0.25	MPOST	79	81	68	0	0	0	6542
	halosulfuron +	0.012	MPOST							
	AG-98	0.25%	MPOST							
5	Triclopyr +	0.19	MPOST	82	100	100	0	0	0	7339
	halosulfuron +	0.047	MPOST							
	AG-98	0.25%	MPOST							
6	Triclopyr +	0.19	MPOST	80	94	86	0	0	0	7004
	halosulfuron +	0.023	MPOST							
	AG-98	0.25%	MPOST							
7	Triclopyr +	0.19	MPOST	83	88	81	0	3	0	7174
	halosulfuron +	0.012	MPOST							
	AG-98	0.25%	MPOST							
8	Triclopyr +	0.19	MPOST	100	100	100	0	0	0	7438
	propanil +	2	MPOST							
	halosulfuron	0.047	MPOST							
9	Triclopyr +	0.19	MPOST	100	95	94	0	0	0	6917
	propanil +	2.0	MPOST							
	halosulfuron	0.023	MPOST							

continued

Table 5. Section 2.

				Hemp sesbania (SEBEX) control			Effect on rice Injury			Effect on rice Yield
	Herbicide	Rate	Application timing	6/28	7/18	8/16	6/28	7/11	7/18	9/21
		(lb ai/A)		---------- (%) ----------						(lb/A)
10	Triclopyr +	0.19	MPOST	100	98	94	0	0	0	7172
	propanil	2.0	MPOST							
	halosulfuron	0.012	MPOST							
11	Triclopyr +	0.19	MPOST	100	95	95	0	0	0	7187
	propanil	2.0	MPOST							
12	Triclopyr +	0.25	MPOST	100	98	93	0	0	0	6785
	propanil	2.0	MPOST							
13	Halosulfuron +	0.047	MPOST	74	86	81	0	0	0	6380
	AG-98	0.25%	MPOST							
14	Halosulfuron +	0.023	MPOST	69	85	79	0	0	0	7021
	AG-98	0.25%	MPOST							
15	Halosulfuron +	0.012	MPOST	46	40	23	0	0	0	5347
	AG-98	0.25%	MPOST							
16	Bentazon +	0.75	PREFL	55	65	30	0	0	0	6453
	Agri-Dex	2.5%	PREFL							
17	Bentazon +	1.0	PREFL	76	68	33	0	0	0	5299
	Agri-Dex	2.5%	PREFL							
18	Halosulfuron +	0.047	PREFL	74	100	100	0	0	0	6553
	Agri-Dex	1.0%	PREFL							
19	Halosulfuron +	0.035	PREFL	57	76	60	0	0	0	6992
	bentazon +	0.5	PREFL							
	Agri-Dex	1.0%	PREFL							
20	Halosulfuron +	0.024	PREFL	80	75	43	0	3	0	7327
	bentazon +	0.75	PREFL							
	Agri-Dex	1.0%	PREFL							
21	Halosulfuron +	0.035	PREFL	50	64	34	0	3	0	6892
	bentazon +	0.75	PREFL							
	Agri-Dex	1.0%	PREFL							
22	Halosulfuron +	0.047	PREFL	95	100	100	0	3	0	7072
	acifluorfen +	0.125	PREFL							
	AG-98	0.25%	PREFL							
23	Halosulfuron +	0.035	PREFL	96	100	100	3	0	0	7348
	acifluorfen +	0.25	PREFL							
	AG-98	0.25%	PREFL							
24	Halosulfuron +	0.047	PREFL	99	100	100	3	0	0	7350
	(acifluorfen + bentazon) +	0.75	PREFL							
	AG-98	0.25%	PREFL							
25	Halosulfuron +	0.035	PREFL	97	100	100	2	0	0	6060
	(acifluorfen + bentazon) +	0.75	PREFL							
	AG-98	0.25%	PREFL							
	LSD (0.05)			18	16	29	1	3	NS	1485

Table 6. Clomazone programs with carfentrazone-ethyl and recommended rice herbicides, Stuttgart, 2000.

SUMMARY

Clomazone (Command) was applied preememergence at 0.4 lb ai/A over the entire experimental area to control grass species. Carfentrazone-ethyl (Aim) was evaluated for the control of broadleaved weeds at 0.025 lb ai/A at the 2- to 3-leaf rice stage applied alone and in a sequential program. Carfentrazone was also evaluated at the 5- to 6-leaf rice stage in combination with bentazon (Basagran), acifluorfen (Blazer), bentazon + acifluorfen (Storm), quinclorac (Facet), fenoxaprop + safener (Ricestar), bispyribac-sodium (Regiment), halosulfuron (Permit), bensulfuron (Londax), triclopyr (Grandstand), propanil (Stam M-4), propanil + molinate (Arrosolo), propanil tank-mixed with thiobencarb (Bolero), and propanil tank-mixed with pendimethalin (Prowl).

Clomazone applied at 0.4 lb ai/A provided 100% control of broadleaf signalgrass and propanil-resistant and -susceptible barnyardgrass. When carfentrazone-ethyl was used in a sequential program or with other broadleaf rice herbicides, >93% control of pitted morningglory, tall morningglory, northern jointvetch, and hemp sesbania was obtained. Carfentrazone-ethyl provided excellent control of broadleaf weeds and worked well in combination with existing rice herbicides.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 7.3

Planting date ..... May 18, 2000
Harvest date ..... September 14, 2000
Crop / Variety ..... rice / Wells
Dates of flushing ..... May 25 and 30, June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: PRE = preemergence; EPOST = early postemergence; and PREFL = preflood.

Application type	PRE	EPOST	PREFL
Date applied	May 18, 2000	June 2, 2000	June 19, 2000
Time	9:00 pm	1:00 pm	10:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	82 / 78	95 / 92	86 / 84
Relative humidity (%)	83	42	85
Wind (mph)	3	2	1
Cloud cover (%)	20	15	50
Soil moisture	dry	adequate	wet
Crop stage/Height	N/A	2-3 lf / 5"	5-6 lf / 12"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015
Boom ht / # Noz / Spacing (in.)	15 / 3 / 18	22 / 3 / 18	27 / 3 / 18
Gpa / Psi	10 / 30	10 / 28	10 / 28
Weed species (density)	----------	[# leaves/height (in.)]	----------
R-ECHCG (20/ft in row)	N/A	2-3 lf / 1.5-2"	5-6 lf / 10"
S-ECHCG (15/ft in row)	N/A	2 lf / 1.5"	4-5 lf / 7-8"
BRAPP (24/ft in row)	N/A	1-2 lf / 1"	5-6 lf / 6"
IPOLA (12/ft in row)	N/A	2-3 lf / 1.5-2"	10 lf / 5-6"
PHBPU (14/ft in row)	N/A	1 lf / 1.5"	8-9 lf / 6"
AESVI (0.25/ft in row)	N/A	cot. /	5 lf / 3"
SEBEX (30/ft in row)	N/A	2-3 lf / 4-5"	7-8 lf / 9-10"

Table 6. Section 1.

				Weed control								
				Barnyardgrass						Broadleaf signalgrass		
			Application	Susceptible (S-ECHCG)			Resistant (R-ECHCG)			(BRAPP)		
	Herbicide	Rate	timing	6/16	7/18	8/17	6/16	7/18	8/17	6/16	7/18	8/17
		(lb ai/A)		(%)								
1	Untreated check			0	0	0	0	0	0	0	0	0
2	Clomazone	0.5	PRE	100	100	100	100	100	100	100	100	100
3	Clomazone *fb* carfentrazone + AG-98 *fb* carfentrazone + AG-98	0.5 0.025 0.25% 0.025 0.25%	PRE EPOST EPOST PREFL PREFL	100	100	100	100	100	100	100	100	100
4	Clomazone *fb* carfentrazone AG-98	0.5 0.025 0.25%	PRE PREFL PREFL	100	100	100	100	100	100	100	100	100
5	Clomazone *fb* carfentrazone + bentazon + AG-98	0.5 0.025 0.75 0.25%	PRE PREFL PREFL PREFL	100	100	100	100	100	100	100	100	100
6	Clomazone *fb* carfentrazone + (acifluorfen + bentazon) + AG-98	0.5 0.025 0.25 0.25%	PRE PREFL PREFL PREFL	100	100	100	100	100	100	100	100	100
7	Clomazone *fb* carfentrazone + acifluorfen + AG-98	0.5 0.025 0.125 0.25	PRE PREFL PREFL PREFL	100	100	100	100	100	100	100	100	100
8	Clomazone *fb* carfentrazone + propanil	0.5 0.025 3.0	PRE PREFL PREFL	100	100	100	100	100	100	100	100	100
9	Clomazone *fb* carfentrazone + propanil + thiobencarb	0.5 0.025 3.0 4.0	PRE PREFL PREFL PREFL	100	100	100	100	100	100	100	100	100
10	Clomazone *fb* carfentrazone + propanil + pendimethalin	0.5 0.025 3.0 1.0	PRE PREFL PREFL PREFL	100	100	100	100	100	100	100	100	100
11	Clomazone *fb* carfentrazone + (propanil + molinate)	0.5 0.025 4.5	PRE PREFL PREFL	100	100	100	100	100	100	100	100	100
12	Clomazone *fb* carfentrazone + quinclorac + AG-98	0.5 0.025 0.375 0.25%	PRE PREFL PREFL PREFL	100	100	100	100	100	100	100	100	100
13	Clomazone *fb* carfentrazone + quinclorac + Agri-Dex	0.5 0.025 0.375 1.25%	PRE PREFL PREFL PREFL	100	100	100	100	100	100	100	100	100
14	Clomazone *fb* carfentrazone + (fenoxaprop + safener) + Agri-Dex	0.5 0.025 0.045 1.25%	PRE PREFL PREFL PREFL	100	100	100	100	100	100	100	100	100

continued

Table 6. Section 1. Continued.

				Weed control								
				Barnyardgrass						Broadleaf signalgrass		
			Application	Susceptible (S-ECHCG)			Resistant (R-ECHCG)			(BRAPP)		
	Herbicide	Rate	timing	6/16	7/18	8/17	6/16	7/18	8/17	6/16	7/18	8/17
		(lb ai/A)		(%)								
15	Clomazone *fb*	0.5	PRE	100	100	100	100	100	100	100	100	100
	carfentrazone +	0.025	PREFL									
	bispyribac-sodium +	0.019	PREFL									
	Kinetic	0.125%	PREFL									
16	Clomazone *fb*	0.5	PRE	100	100	100	100	100	100	100	100	100
	carfentrazone +	0.025	PREFL									
	halosulfuron +	0.047	PREFL									
	AG-98	0.25%	PREFL									
17	Clomazone *fb*	0.5	PRE	100	100	100	100	100	100	100	100	100
	carfentrazone +	0.025	PREFL									
	bensulfuron +	0.0625	PREFL									
	AG-98	0.25%	PREFL									
18	Clomazone *fb*	0.5	PRE	100	100	100	100	100	100	100	100	100
	triclopyr +	0.38	PREFL									
	AG-98	0.25%	PREFL									
19	Quinclorac *fb*	0.375	PRE	100	100	100	100	100	100	100	100	100
	propanil +	4.0	PREFL									
	triclopyr	0.25	PREFL									
20	Clomazone *fb*	0.3	PRE	100	100	100	100	100	100	100	100	100
	quinclorac +	0.375	PRE									
	(propanil + molinate)	4.5	PREFL									
21	Propanil +	4.0	EPOST	86	100	100	74	100	100	86	100	100
	pendimethalin *fb*	1.0	EPOST									
	propanil +	3.0	PREFL									
	triclopyr	0.25	PREFL									
22	Clomazone *fb*	0.5	PRE	100	100	100	100	100	100	100	100	100
	propanil	4.0	PREFL									
	triclopyr	0.25	PREFL									
	LSD (0.05)			4	0	0	6	0	0	4	0	0

continued

Table 6. Section 2.

				Weed control								
				Pittted morningglory (IPOLA)			Tall morningglory (PHBPU)			Hemp sesbania (SEBEX)		
			Application									
	Herbicide	Rate	timing	6/16	7/18	8/17	6/16	7/18		6/16	7/18	8/17
		(lb ai/A)		(%)								
1	Untreated check			0	0	0	0	0		0	0	0
2	Clomazone	0.5	PRE	0	0	0	0	0		0	0	0
3	Clomazone *fb*	0.5	PRE	84	100	100	86	100		97	100	100
	carfentrazone +	0.025	EPOST									
	AG-98 *fb*	0.25%	EPOST									
	carfentrazone +	0.025	PREFL									
	AG-98	0.25%	PREFL									
4	Clomazone *fb*	0.5	PRE	0	100	100	0	100		0	100	100
	carfentrazone	0.025	PREFL									
	AG-98	0.25%	PREFL									

continued

Table 6. Section 2. Continued.

				Weed control								
				Pittted morningglory (IPOLA)			Tall morningglory (PHBPU)		Hemp sesbania (SEBEX)		
	Herbicide	Rate	Application timing	6/16	7/18	8/17	6/16	7/18	6/16	7/18	8/17
		(lb ai/A)		---------- (%) ----------							
5	Clomazone *fb* carfentrazone + bentazon + AG-98	0.5 0.025 0.75 0.25%	PRE PREFL PREFL PREFL	0	100	100	0	100	0	100	98
6	Clomazone *fb* carfentrazone + (acifluorfen + bentazon) + AG-98	0.5 0.025 0.25 0.25%	PRE PREFL PREFL PREFL	0	100	100	0	100	0	100	100
7	Clomazone *fb* carfentrazone + acifluorfen + AG-98	0.5 0.025 0.125 0.25	PRE PREFL PREFL PREFL	0	100	100	0	100	0	100	100
8	Clomazone *fb* carfentrazone + propanil	0.5 0.025 3.0	PRE PREFL PREFL	0	100	100	0	100	0	100	100
9	Clomazone *fb* carfentrazone + propanil + thiobencarb	0.5 0.025 3.0 4.0	PRE PREFL PREFL PREFL	0	100	100	0	100	0	100	100
10	Clomazone *fb* carfentrazone + propanil + pendimethalin	0.5 0.025 3.0 1.0	PRE PREFL PREFL PREFL	0	100	100	0	100	0	100	100
11	Clomazone *fb* carfentrazone + (propanil + molinate)	0.5 0.025 4.5	PRE PREFL PREFL	0	100	100	0	100	0	100	100
12	Clomazone *fb* carfentrazone + quinclorac + AG-98	0.5 0.025 0.375 0.25%	PRE PREFL PREFL PREFL	0	100	100	0	100	0	100	100
13	Clomazone *fb* carfentrazone + quinclorac + Agri-Dex	0.5 0.025 0.375 1.25%	PRE PREFL PREFL PREFL	0	100	100	0	100	0	100	100
14	Clomazone *fb* carfentrazone + (fenoxaprop + safener) + Agri-Dex	0.5 0.025 0.045 1.25%	PRE PREFL PREFL PREFL	0	100	100	0	100	0	100	100
15	Clomazone *fb* carfentrazone + bispyribac-sodium + Kinetic	0.5 0.025 0.019 0.125%	PRE PREFL PREFL PREFL	0	100	100	0	100	0	100	100
16	Clomazone *fb* carfentrazone + halosulfuron + AG-98	0.5 0.025 0.047 0.25%	PRE PREFL PREFL PREFL	0	100	100	0	100	0	100	98

continued

Table 6. Section 2. Continued.

				Weed control								
				Pittted morningglory (IPOLA)			Tall morningglory (PHBPU)		Hemp sesbania (SEBEX)		
	Herbicide	Rate	Application timing	6/16	7/18	8/17	6/16	7/18	6/16	7/18	8/17
		(lb ai/A)		---------- (%) ----------							
17	Clomazone *fb* carfentrazone + bensulfuron + AG-98	0.5 0.025 0.0625 0.25%	PRE PREFL PREFL PREFL	0	100	100	0	100	0	100	100
18	Clomazone *fb* triclopyr + AG-98	0.5 0.38 0.25%	PRE PREFL PREFL	0	100	100	0	100	0	100	100
19	Quinclorac *fb* propanil + triclopyr	0.375 4.0 0.25	PRE PREFL PREFL	100	100	100	100	100	97	100	100
20	Clomazone *fb* quinclorac + (propanil + molinate)	0.3 0.375 4.5	PRE PRE PREFL	100	100	100	100	100	92	100	100
21	Propanil + pendimethalin *fb* propanil + triclopyr	4.0 1.0 3.0 0.25	EPOST EPOST PREFL PREFL	59	100	100	61	100	94	100	100
22	Clomazone *fb* propanil triclopyr	0.5 4.0 0.25	PRE PREFL PREFL	0	100	100	0	100	0	100	100
	LSD (0.05)			4	0	0	4	0	2	0	2

continued

Table 6. Section 3.

				Weed control						
				Northern jointvetch (AESVI)			Effect on rice Chlorosis			
	Herbicide	Rate	Application timing	6/16	7/18	8/17	6/1	6/8	6/16	6/26
		(lb ai/A)		---------- (%) ----------						
1	Untreated check			0	0	0	0	0	0	0
2	Clomazone	0.5	PRE	0	0	0	14	46	5	2
3	Clomazone *fb* carfentrazone + AG-98 *fb* carfentrazone + AG-98	0.5 0.025 0.25% 0.025 0.25%	PRE EPOST EPOST PREFL PREFL	95	100	100	15	49	5	2
4	Clomazone *fb* carfentrazone AG-98	0.5 0.025 0.25%	PRE PREFL PREFL	0	100	94	14	45	5	3
5	Clomazone *fb* carfentrazone + bentazon + AG-98	0.5 0.025 0.75 0.25%	PRE PREFL PREFL PREFL	0	100	98	20	46	5	2
6	Clomazone *fb* carfentrazone + (acifluorfen + bentazon) + AG-98	0.5 0.025 0.25 0.25%	PRE PREFL PREFL PREFL	0	100	98	9	45	5	2

continued

Table 6. Section 3. Continued.

	Herbicide	Rate	Application timing	Weed control: Northern jointvetch (AESVI) 6/16	7/18	8/17	Effect on rice: Chlorosis 6/1	6/8	6/16	6/26
		(lb ai/A)		(%)						
7	Clomazone *fb* carfentrazone + acifluorfen + AG-98	0.5 0.025 0.125 0.25	PRE PREFL PREFL PREFL	0	100	100	15	49	5	2
8	Clomazone *fb* carfentrazone + propanil	0.5 0.025 3.0	PRE PREFL PREFL	0	100	100	16	51	5	2
9	Clomazone *fb* carfentrazone + propanil + thiobencarb	0.5 0.025 3.0 4.0	PRE PREFL PREFL PREFL	0	100	100	13	46	5	2
10	Clomazone *fb* carfentrazone + propanil + pendimethalin	0.5 0.025 3.0 1.0	PRE PREFL PREFL PREFL	0	100	98	11	53	5	2
11	Clomazone *fb* carfentrazone + (propanil + molinate)	0.5 0.025 4.5	PRE PREFL PREFL	0	100	100	12	51	5	2
12	Clomazone *fb* carfentrazone + quinclorac + AG-98	0.5 0.025 0.375 0.25%	PRE PREFL PREFL PREFL	0	100	100	18	50	5	2
13	Clomazone *fb* carfentrazone + quinclorac + Agri-Dex	0.5 0.025 0.375 1.25%	PRE PREFL PREFL PREFL	0	100	98	21	54	6	2
14	Clomazone *fb* carfentrazone + (fenoxaprop + safener) + Agri-Dex	0.5 0.025 0.045 1.25%	PRE PREFL PREFL PREFL	0	100	100	15	50	5	2
15	Clomazone *fb* carfentrazone + bispyribac-sodium + Kinetic	0.5 0.025 0.019 0.125%	PRE PREFL PREFL PREFL	0	100	98	16	50	5	3
16	Clomazone *fb* carfentrazone + halosulfuron + AG-98	0.5 0.025 0.047 0.25%	PRE PREFL PREFL PREFL	0	100	100	13	51	5	2
17	Clomazone *fb* carfentrazone + bensulfuron + AG-98	0.5 0.025 0.0625 0.25%	PRE PREFL PREFL PREFL	0	100	95	12	49	5	1
18	Clomazone *fb* triclopyr + AG-98	0.5 0.38 0.25%	PRE PREFL PREFL	0	100	100	10	51	5	2
19	Quinclorac *fb* propanil + triclopyr	0.375 4.0 0.25	PRE PREFL PREFL	96	100	100	0	0	0	2

continued

Table 6. Section 3. Continued.

				Weed control			Effect on rice			
				Northern jointvetch (AESVI)			Chlorosis			
	Herbicide	Rate	Application timing	6/16	7/18	8/17	6/1	6/8	6/16	6/26
		(lb ai/A)		---------- (%) ----------						
20	Clomazone *fb*	0.3	PRE	94	100	100	0	13	2	2
	quinclorac +	0.375	PRE							
	(propanil + molinate)	4.5	PREFL							
21	Propanil +	4.0	EPOST	93	100	100	0	0	0	2
	pendimethalin *fb*	1.0	EPOST							
	propanil +	3.0	PREFL							
	triclopyr	0.25	PREFL							
22	Clomazone *fb*	0.5	PRE	0	100	100	18	46	5	2
	propanil	4.0	PREFL							
	triclopyr	0.25	PREFL							
	LSD (0.05)			3	0	5	7	9	1	2

continued

Table 6. Section 4.

				Effect on rice								
				Biomass reduction				Injury				Yield
	Herbicide	Rate	Application timing	6/1	6/8	6/16	6/26	6/1	6/8	6/16	6/26	9/14
		(lb ai/A)		---------- (%) ----------								(lb/A)
1	Untreated Check			0	0	0	0	0	0	0	0	4366
2	Clomazone	0.5	PRE	0	1	5	0	4	10	5	3	6982
3	Clomazone *fb*	0.5	PRE	0	1	5	0	4	13	5	11	7823
	carfentrazone +	0.025	EPOST									
	AG-98 *fb*	0.25%	EPOST									
	carfentrazone +	0.025	PREFL									
	AG-98	0.25%	PREFL									
4	Clomazone *fb*	0.5	PRE	0	0	5	0	4	10	5	9	8763
	carfentrazone	0.025	PREFL									
	AG-98	0.25%	PREFL									
5	Clomazone *fb*	0.5	PRE	0	0	5	0	3	10	5	5	7808
	carfentrazone +	0.025	PREFL									
	bentazon +	0.75	PREFL									
	AG-98	0.25%	PREFL									
6	Clomazone *fb*	0.5	PRE	0	0	5	0	3	10	5	8	8961
	carfentrazone +	0.025	PREFL									
	(acifluorfen + bentazon)	0.25	PREFL									
	+ AG-98	0.25%	PREFL									
7	Clomazone *fb*	0.5	PRE	0	0	5	0	4	10	5	9	7366
	carfentrazone +	0.025	PREFL									
	acifluorfen +	0.125	PREFL									
	AG-98	0.25	PREFL									
8	Clomazone *fb*	0.5	PRE	0	0	5	0	5	10	5	4	9158
	carfentrazone +	0.025	PREFL									
	propanil	3.0	PREFL									
9	Clomazone *fb*	0.5	PRE	0	0	5	0	3	10	5	8	7307
	carfentrazone +	0.025	PREFL									
	propanil +	3.0	PREFL									
	thiobencarb	4.0	PREFL									

continued

Table 6. Section 4. Continued.

				Effect on rice								
			Application	Biomass reduction				Injury				Yield
	Herbicide	Rate	timing	6/1	6/8	6/16	6/26	6/1	6/8	6/16	6/26	9/14
		(lb ai/A)		---------- (%) ----------								(lb/A)
10	Clomazone *fb*	0.5	PRE	0	0	5	0	5	10	5	6	8333
	carfentrazone +	0.025	PREFL									
	propanil +	3.0	PREFL									
	pendimethalin	1.0	PREFL									
11	Clomazone *fb*	0.5	PRE	0	0	5	0	4	10	5	6	8006
	carfentrazone +	0.025	PREFL									
	(propanil + molinate)	4.5	PREFL									
12	Clomazone *fb*	0.5	PRE	0	0	5	0	4	10	5	4	8317
	carfentrazone +	0.025	PREFL									
	quinclorac +	0.375	PREFL									
	AG-98	0.25%	PREFL									
13	Clomazone *fb*	0.5	PRE	0	0	5	0	4	10	5	4	8432
	carfentrazone +	0.025	PREFL									
	quinclorac +	0.375	PREFL									
	Agri-Dex	1.25%	PREFL									
14	Clomazone *fb*	0.5	PRE	0	1	5	0	25	10	5	5	9491
	carfentrazone +	0.025	PREFL									
	(fenoxaprop + safener) +	0.045	PREFL									
	Agri-Dex	1.25%	PREFL									
15	Clomazone *fb*	0.5	PRE	0	0	5	0	3	10	5	4	8462
	carfentrazone +	0.025	PREFL									
	bispyribac-sodium +	0.019	PREFL									
	Kinetic	0.125%	PREFL									
16	Clomazone *fb*	0.5	PRE	0	0	11	0	3	10	13	5	8835
	carfentrazone +	0.025	PREFL									
	halosulfuron +	0.047	PREFL									
	AG-98	0.25%	PREFL									
17	Clomazone *fb*	0.5	PRE	0	0	5	0	6	10	6	2	9234
	carfentrazone +	0.025	PREFL									
	bensulfuron +	0.0625	PREFL									
	AG-98	0.25%	PREFL									
18	Clomazone *fb*	0.5	PRE	0	0	5	0	1	9	5	1	9118
	triclopyr +	0.38	PREFL									
	AG-98	0.25%	PREFL									
19	Quinclorac *fb*	0.375	PRE	4	14	14	5	16	26	4	11	7892
	propanil +	4.0	PREFL									
	triclopyr	0.25	PREFL									
20	Clomazone *fb*	0.3	PRE	6	14	20	0	14	23	21	23	8054
	quinclorac +	0.375	PRE									
	(propanil + molinate)	4.5	PREFL									
21	Propanil +	4.0	EPOST	0	0	0	0	0	5	0	5	7909
	pendimethalin *fb*	1.0	EPOST									
	propanil +	3.0	PREFL									
	triclopyr	0.25	PREFL									
22	Clomazone *fb*	0.5	PRE	1	0	5	0	6	10	5	3	8862
	propanil	4.0	PREFL									
	triclopyr	0.25	PREFL									
	LSD (0.05)			5	7	13	3	16	7	11	11	1420

Table 7. Levee weed control with clomazone, Stuttgart, 2000.

SUMMARY

Clomazone (Command) was evaluated for it use in levee weed control in rice. Clomazone was applied at 0.4 lb ai/A preemergence to the experimental area prior to levee formation. Levees were then pulled three times in the same direction parallel through the center of each plot with a levee disk. After levee formation, additional clomazone was applied at 0.2 lb ai/A on two sets of plots for a total rate of clomazone to 0.6 lb ai/A for these two treatments. Other levee treatments included propanil (Stam M-4), fenoxaprop + safener (Ricestar), and bispyribac-sodium (Regiment) each applied at labeled rates at the 2- to 3-leaf and 5- to 6-leaf grass stages. Combinations of these postemergence herbicides were also evaluated

This research demonstrated that clomazone will need to be used in a program approach to obtain effective control of propanil-resistant and -susceptible barnyardgrass on the levees. Clomazone gave little residual control on the levee if applied prior to levee formation indicating the need for a postemergence program to maintain effective weed control. Only fenoxaprop + safener and clomazone applied after levee formation followed by propanil were effective for control of propanil-resistant and -susceptible barnyardgrass. Levees were formed in this experiment with a levee disk; therefore, differences in control may be observed if a levee squeezer is used instead.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 7.3

Planting date ..... May 24, 2000
Harvest date ..... N/A
Crop / Variety ..... rice / Wells
Dates of flushing ..... May 25 and 30, June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: PRE-A = preemergence applied before levee formation; PRE-B = preemergence applied after levee formation; EPOST = early postemergence; and PREFL = preflood.

Application type	PRE-A	PRE-B	EPOST	PREFL
Date applied	May 18, 2000	May 25, 2000	June 19, 2000	July 5, 2000
Time	10:00 pm	12:00 pm	1:00 pm	12:00 pm
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	82 / 78	85 / 76	93 / 84	98 / 85
Relative humidity (%)	20	76	85	90
Wind (mph)	3	3	1	2
Cloud cover (%)	20	50	50	40
Soil moisture	dry	dry	wet	dry
Crop stage/Height	N/A	N/A	2 lf / 5.5"	4-5 lf / 9"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015
Boom ht / # Noz / Spacing (in.)	16 / 3 / 18	16 / 3 / 18	20 / 3 / 18	28 / 3 / 18
Gpa / Psi	10 / 30	10 / 30	10 / 30	10 / 30
Weed species (density)	---------- [# leaves/height (in.)] ----------			
R-ECHCG (3/ft^2)	N/A	N/A	1-2 lf / 2"	3-4 lf / 5-6"
S-ECHCG (10/ft^2)	N/A	N/A	2-3 lf / 3-4"	4-5 lf / 6-8"
PHYAN (1/ft^2)	N/A	N/A	7 lf / 6"5"	12-15 lf / 12-14"

Table 7. Section 1.

				Weed control							
				Barnyardgrass					Cutleaf groundcherry		
			Application	Resistant (R-ECHCG)			Susceptible (S-ECHCG)		(PHYAN)		
	Herbicide	Rate	timing	6/28	7/18	9/16	6/28	7/18	6/11	6/18	9/16
		(lb ai/A)		---------- (%) ----------							
1	Untreated check			0	21	9	19	21	10	8	31
	Clomazone	0.4	PRE-A								
2	Clomazone *fb*	0.4	PRE-A	91	44	25	65	44	10	8	18
	clomazone (after levee)	0.2	PRE-B								
3	Clomazone *fb*	0.4	PRE-A	84	64	35	86	64	99	100	96
	propanil	4.0	EPOST								
4	Clomazone *fb*	0.4	PRE-A	0	13	26	0	13	30	73	78
	propanil	4.0	PREFL								
5	Clomazone *fb*	0.4	PRE-A	85	66	65	98	66	96	100	100
	propanil *fb*	4.0	EPOST								
	popanil (if needed)	4.0	PREFL								
6	Clomazone *fb*	0.4	PRE-A	98	90	94	98	90	99	100	100
	clomazone (after levee)	0.2	PRE-B								
	fb propanil *fb*	4.0	EPOST								
	propanil (if needed)	4.0	PREFL								
7	Clomazone *fb*	0.4	PRE-A	85	98	91	76	98	10	15	0
	(fenoxaprop + safener)	0.098	EPOST								
8	Clomazone *fb*	0.4	PRE-A	86	76	79	83	76	100	100	100
	clomazone +	0.4	EPOST								
	propanil	4.0	EPOST								
9	Clomazone *fb*	0.4	PRE-A	81	73	45	75	73	23	60	75
	quinclorac +	0.25	EPOST								
	AG-98	0.25%	EPOST								
10	Clomazone *fb*	0.4	PRE-A	98	93	74	100	93	100	100	100
	quinclorac +	0.25	EPOST								
	propanil	4.0	EPOST								
11	Clomazone *fb*	0.4	PRE-A	0	28	70	0	28	18	18	8
	bipyribac-sodium +	0.019	PREFL								
	Kinetic	0.125%	PREFL								
12	Clomazone *fb*	0.4	PRE-A	0	30	59	0	30	35	70	61
	propanil +	4.0	PREFL								
	bispyribac-sodium +	0.019	PREFL								
	Kinetic	0.125%	PREFL								
13	Clomazone *fb*	0.4	PRE-A	0	23	44	0	23	46	74	100
	propanil +	4.0	PREFL								
	triclopyr	0.25	PREFL								
	LSD (0.05)			14	25	30	27	25	13	20	31

continued

Table 7. Section 2.

				Effect on rice								
			Application	Chlorosis			Biomass reduction			Injury		
	Herbicide	Rate	timing	6/16	6/28	7/11	6/16	6/28	7/11	6/16	6/28	7/11
		(lb ai/A)		---------- (%) ----------								
1	Untreated check			0	3	0	0	0	0	0	0	0
	Clomazone	0.4	PRE-A									
2	Clomazone *fb*	0.4	PRE-A	2	1	0	0	3	0	0	5	0
	clomazone (after levee)	0.2	PRE-B									
3	Clomazone *fb*	0.4	PRE-A	0	0	0	0	1	0	0	6	0
	propanil	4.0	EPOST									
4	Clomazone *fb*	0.4	PRE-A	0	0	0	0	0	0	0	0	0
	propanil	4.0	PREFL									
5	Clomazone *fb*	0.4	PRE-A	0	0	0	0	5	0	0	9	0
	propanil *fb*	4.0	EPOST									
	popanil (if needed)	4.0	PREFL									
6	Clomazone *fb*	0.4	PRE-A	0	0	0	0	4	0	0	13	0
	clomazone (after levee)	0.2	PRE-B									
	fb propanil *fb*	4.0	EPOST									
	propanil (if needed)	4.0	PREFL									
7	Clomazone *fb*	0.4	PRE-A	0	1	0	0	5	0	0	10	0
	(fenoxaprop + safener)	0.098	EPOST									
8	Clomazone *fb*	0.4	PRE-A	0	1	0	0	1	0	0	4	0
	clomazone +	0.4	EPOST									
	propanil	4.0	EPOST									
9	Clomazone *fb*	0.4	PRE-A	0	2	0	0	4	0	0	10	0
	quinclorac +	0.25	EPOST									
	AG-98	0.25%	EPOST									
10	Clomazone *fb*	0.4	PRE-A	0	1	0	0	1	0	0	5	0
	quinclorac +	0.25	EPOST									
	propanil	4.0	EPOST									
11	Clomazone *fb*	0.4	PRE-A	0	0	0	0	0	0	0	0	0
	bipyribac-sodium +	0.019	PREFL									
	Kinetic	0.125%	PREFL									
12	Clomazone *fb*	0.4	PRE-A	0	0	0	0	0	0	0	0	0
	propanil +	4.0	PREFL									
	bispyribac-sodium +	0.019	PREFL									
	Kinetic	0.125%	PREFL									
13	Clomazone *fb*	0.4	PRE-A	0	1	0	0	0	0	0	0	0
	propanil +	4.0	PREFL									
	triclopyr	0.25	PREFL									
	LSD (0.05)			1	3	0	0	5	0	0	9	0

Table 8. Herbicide programs for reduced-tillage production in non-herbicide-tolerant and herbicide-tolerant rice, Stuttgart, 2000.

SUMMARY

This experiment evaluated burndown programs that could be used with conventional rice cultivars and herbicide-tolerant rice cultivars in a reduced-tillage production system. Weed species were planted perpendicular to the plots four weeks prior to burndown applications. Three rice cultivars were used in this experiment, with Wells being used in burndown programs using glyphosate and paraquat; Clearfield 3291 used with imazethapyr programs; and Liberty-tolerant Bengal used with glufosinate programs.

Clomazone (Command) at 0.3, 0.4, 0.6, or 0.8 lb ai/A was tank-mixed with glyphosate (Roundup Ultra) at 1.0 lb ai/A and paraquat (Gramoxone) at 0.63 lb ai/A and evaluated for burndown control and residual grass activity. Burndown treatments were applied 14 days prior to planting. These treatments were followed by propanil (Stam M-4) at the 2- to 3-leaf rice stage. Imazethapyr at 0.063 lb ai/A + glyphosate at 0.75 lb ai/A was also evaluated for burndown control and residual grass activity. An in-season application of propanil (Stam M-4) was applied at the 2- to 3-leaf rice stage for hemp sesbania and northern jointvetch control. Glufosinate at 0.31 lb ai/A was also tank-mixed with clomazone at 0.3, 0.4, 0.6, or 0.8 lb ai/A and evaluated for burndown control and residual grass activity. Glufosinate was also applied at 0.31 lb/A at the 2- to 3-leaf rice stage.

In this reduced-tillage system, all burndown programs were effective for the control of existing winter and early spring vegetation. Chlorosis was minimal with all combinations of clomazone at rates from 0.2 to 0.8 lb ai/A regardless of the burndown herbicide tank-mixed with clomazone. Generally 0.6 or 0.8 lb/A of clomazone was needed for season-long control of propanil-resistant and -susceptible barnyardgrass. Imazethapyr gave >80% control of propanil-resistant and -susceptible barnyardgrass. Broadleaf signalgrass control was exceptional for all treatments containing clomazone or imazethapyr. All programs controlled northern jointvetch and hemp sesbania.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 5.2

Planting date ..... June 9, 2000
Harvest date ..... N/A
Crop / Variety ..... rice / Wells, Bengal, and Clearfield
Dates of flushing ..... July 8 and 15, 2000
Date of Flooding ..... July 18, 2000

Comments: 14-DPP = 14 days preplant; 7-DPP = 7 days preplant; and EPOST = early postemergence.

Application type	14-DPP	7-DPP	EPOST
Date applied	May 25, 2000	June 6, 2000	June 28, 2000
Time	10:30 am	7:00 pm	8:00 am
Incorporation equipment	N/A	N/A	N/A
Air/Soil temperature (F)	76 / 75	78 / 78	72 / 75
Relative humidity (%)	84	40	90
Wind (mph)	3	2	3
Cloud cover (%)	100	0	50
Soil moisture	moist	moist	moist
Crop stage/Height	N/A	N/A	2-3 lf / 5”
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	T-Jet DF / 80015	T-Jet DF / 110015	T-Jet DF / 110015
Boom ht / # Noz / Spacing (in.)	29 / 3 / 18	25 / 3 / 18	30 / 3 / 18
Gpa / Psi	15 / 40	15 / 38	15 / 38
Weed species (density)	---------- [# leaves/height (in.)] ----------		
S-ECHCG (15/ft)	2-3 lf / 3-4”	5-6 lf / 6-7”	10 lf / 12”
R-ECHCG (20/ft)	2-3 lf / 3-4”	5-6 lf / 6-7”	10 lf / 12”
ORYSA (4/ft)	2 lf / 4”	4 lf / 7”	6-8 lf / 12-14”
SEBEX (12/ft)	3 lf / 3”	4 lff / 5”	12 lf / 10-12”
AESVI (3-4/ft)	3 lf / 2-3”	5 lf / 3-4”	8-10 lf / 4-6”
IPOLA (8/ft)	3-4 lf / 3-4”	7 lf / 5-6”	25+ lf / 8-9”
ERICA (0.25/ft^2)	100+ lf / 13-15”	N/A	N/A
BRAPP (5/ft^2)	5-6 lf / 4-5”	5-6 lf / 4-5”	19 lf / 8-10”

Table 8. Section 1.

				Barnyardgrass control							
				Susceptible (S-ECHCG)				Resistant (R-ECHCG)			
	Herbicide	Rate	Application timing	6/9	6/29	7/11	8/17	6/9	6/29	7/11	8/17
		(lb ai/A)		(%)							
1	Untreated Wells			0	0	0	0	0	0	0	0
2	Untreated Liberty Bengal			0	0	0	0	0	0	0	0
3	Untreated Clearfield			5	0	0	0	5	0	0	0
4	Glyphosate *fb*	1.0	14-DPP	100	98	97	66	100	93	91	66
	propanil	3.0	EPOST								
5	Glufosinate *fb*	0.31	14-DPP	77	25	36	0	73	10	5	0
	propanil	3.0	EPOST								
6	Paraquat +	0.625	7-DPP	79	59	60	15	79	59	25	15
	AG-98 *fb*	0.25	7-DPP								
	propanil	3.0	EPOST								
7	(Imazethapyr +										
	glyphosate) *fb*	0.813	14-DPP	99	100	100	98	99	100	100	96
	propanil	3.0	EPOST								
8	Glyphosate +	1.0	14-DPP	100	100	93	63	100	100	85	63
	clomazone *fb*	0.3	14-DPP								
	propanil	3.0	EPOST								
9	Glufosinate +	0.31	14-DPP	83	78	89	39	83	15	75	39
	clomazone *fb*	0.3	14-DPP								
	glufosinate	0.31	EPOST								
10	Paraquat +	0.625	7-DPP	76	90	93	13	76	70	38	13
	clomazone +	0.3	7-DPP								
	AG-98 *fb*	0.25	7-DPP								
	propanil	3.0	EPOST								
11	(Imazethapyr +										
	glyphosate)	0.813	14-DPP	100	100	99	81	100	100	99	81
12	Glyphosate +	1.0	14-DPP	100	99	100	76	100	99	98	76
	clomazone *fb*	0.4	14-DPP								
	propanil	3.0	EPOST								
13	Glufosinate +	0.31	14-DPP	89	58	92	53	83	38	80	53
	clomazone *fb*	0.4	14-DPP								
	glufosinate	0.31	EPOST								
14	Paraquat +	0.625	7-DPP	70	84	88	20	68	70	45	20
	clomazone +	0.4	7-DPP								
	AG-98 *fb*	0.25	7-DPP								
	propanil	3.0	EPOST								
15	(Imazethapyr +										
	glyphosate)	0.813	14-DPP	100	100	100	80	100	100	98	83
16	Glyphosate +	1.0	14-DPP	100	98	100	88	100	98	100	88
	clomazone *fb*	0.6	14-DPP								
	propanil	3.0	EPOST								
17	Glufosinate +	0.31	14-DPP	91	91	90	56	87	64	63	56
	clomazone *fb*	0.6	14-DPP								
	glufosinate	0.31	EPOST								
18	Paraquat +	0.625	7-DPP	81	91	90	63	79	90	85	63
	clomazone +	0.6	7-DPP								
	AG-98 *fb*	0.25	7-DPP								
	propanil	3.0	EPOST								
19	(Imazethapyr +										
	glyphosate) *fb*	0.813	14-DPP	94	100	100	89	94	100	100	89
	propanil	3.0	EPOST								
20	Glyphosate +	1.0	14-DPP	100	100	100	91	100	100	100	91
	clomazone *fb*	0.8	14-DPP								
	propanil	3.0	EPOST								

continued

Table 8. Section 1. Continued.

				Barnyardgrass control							
			Application	Susceptible (S-ECHCG)				Resistant (R-ECHCG)			
	Herbicide	Rate	timing	6/9	6/29	7/11	8/17	6/9	6/29	7/11	8/17
		(lb ai/A)		---------- (%) ----------							
21	Glufosinate +	0.31	14-DPP	100	94	100	96	100	94	100	96
	clomazone *fb*	0.8	14-DPP								
	glufosinate	0.31	EPOST								
22	Paraquat +	0.625	7-DPP	65	95	98	50	65	83	83	50
	clomazone +	0.8	7-DPP								
	AG-98 *fb*	0.25	7-DPP								
	propanil	3.0	EPOST								
23	(Imazethapyr +										
	glyphosate) *fb*	0.813	14-DPP	100	99	100	93	100	100	100	93
	propanil	3.0	EPOST								
	LSD (0.05)			15	14	17	29	16	22	25	29

continued

Table 8. Section 2.

			Application	Broadleaf signalgrass (BRAPP)				Pitted morningglory (IPOLA)		
	Herbicide	Rate	timing	6/9	6/29	7/11	8/17	6/9	6/29	7/11
		(lb ai/A)		---------- (%) ----------						
1	Untreated Wells			0	0	0	0	0	0	0
2	Untreated Liberty Bengal			0	0	0	0	0	0	0
3	Untreated Clearfield			3	23	0	0	0	0	0
4	Glyphosate *fb*	1.0	14-DPP	100	35	80	83	85	76	90
	propanil	3.0	EPOST							
5	Glufosinate *fb*	0.31	14-DPP	77	30	49	68	93	59	99
	propanil	3.0	EPOST							
6	Paraquat +	0.625	7-DPP	79	79	96	90	98	94	100
	AG-98 *fb*	0.25	7-DPP							
	propanil	3.0	EPOST							
7	(Imazethapyr +									
	glyphosate) *fb*	0.813	14-DPP	99	100	100	100	75	90	93
	propanil	3.0	EPOST							
8	Glyphosate +	1.0	14-DPP	100	89	98	100	89	78	95
	clomazone *fb*	0.3	14-DPP							
	propanil	3.0	EPOST							
9	Glufosinate +	0.31	14-DPP	81	56	90	93	86	63	100
	clomazone *fb*	0.3	14-DPP							
	glufosinate	0.31	EPOST							
10	Paraquat +	0.625	7-DPP	78	84	98	100	94	94	97
	clomazone +	0.3	7-DPP							
	AG-98 *fb*	0.25	7-DPP							
	propanil	3.0	EPOST							
11	(Imazethapyr +									
	glyphosate)	0.813	14-DPP	100	86	93	78	85	73	80
12	Glyphosate +	1.0	14-DPP	100	91	100	99	83	66	83
	clomazone *fb*	0.4	14-DPP							
	propanil	3.0	EPOST							
13	Glufosinate +	0.31	14-DPP	89	78	99	100	93	73	100
	clomazone *fb*	0.4	14-DPP							
	glufosinate	0.31	EPOST							

continued

Table 8. Section 2. Continued.

	Herbicide	Rate	Application timing	Broadleaf signalgrass (BRAPP) 6/9	6/29	7/11	8/17	Pitted morningglory (IPOLA) 6/9	6/29	7/11
		(lb ai/A)		(%)						
14	Paraquat +	0.625	7-DPP	65	95	95	95	78	98	99
	clomazone +	0.4	7-DPP							
	AG-98 *fb*	0.25	7-DPP							
	propanil	3.0	EPOST							
15	(Imazethapyr + glyphosate)	0.813	14-DPP	100	100	100	100	86	98	90
16	Glyphosate +	1.0	14-DPP	100	96	100	100	86	85	86
	clomazone *fb*	0.6	14-DPP							
	propanil	3.0	EPOST							
17	Glufosinate +	0.31	14-DPP	89	81	95	90	85	84	100
	clomazone *fb*	0.6	14-DPP							
	glufosinate	0.31	EPOST							
18	Paraquat +	0.625	7-DPP	76	91	100	100	94	100	99
	clomazone +	0.6	7-DPP							
	AG-98 *fb*	0.25	7-DPP							
	propanil	3.0	EPOST							
19	(Imazethapyr + glyphosate) *fb*	0.813	14-DPP	96	93	100	100	74	93	93
	propanil	3.0	EPOST							
20	Glyphosate +	1.0	14-DPP	100	100	100	100	83	81	83
	clomazone *fb*	0.8	14-DPP							
	propanil	3.0	EPOST							
21	Glufosinate +	0.31	14-DPP	95	96	100	100	100	89	100
	clomazone *fb*	0.8	14-DPP							
	glufosinate	0.31	EPOST							
22	Paraquat +	0.625	7-DPP	65	94	98	100	93	99	99
	clomazone +	0.8	7-DPP							
	AG-98 *fb*	0.25	7-DPP							
	propanil	3.0	EPOST							
23	(Imazethapyr + glyphosate) *fb*	0.813	14-DPP	100	93	98	94	78	85	95
	propanil	3.0	EPOST							
	LSD			14	27	16	25	18	31	13

continued

Table 8. Section 3.

	Herbicide	Rate	Application timing	Northern jointvetch (AESVI) 6/9	6/29	7/11	8/17	Hemp sesbania (SEBEX) 6/9	6/29	7/11	8/17
		(lb ai/A)		(%)							
1	Untreated Wells			0	0	0	0	0	0	0	0
2	Untreated Liberty Bengal			0	0	0	0	0	0	0	0
3	Untreated Clearfield			3	0	0	0	0	0	0	0
4	Glyphosate *fb*	1.0	14-DPP	94	89	100	100	95	78	100	95
	propanil	3.0	EPOST								
5	Glufosinate *fb*	0.31	14-DPP	95	65	100	75	99	68	100	75
	propanil	3.0	EPOST								
6	Paraquat +	0.625	7-DPP	100	89	100	100	100	91	100	99
	AG-98 *fb*	0.25	7-DPP								
	propanil	3.0	EPOST								
7	(Imazethapyr + glyphosate) *fb*	0.813	14-DPP	93	90	100	100	90	99	100	100
	propanil	3.0	EPOST								

continued

Table 8. Section 3. Continued.

	Herbicide	Rate	Application timing	Northern jointvetch (AESVI) 6/9	6/29	7/11	8/17	Hemp sesbania (SEBEX) 6/9	6/29	7/11	8/17
		(lb ai/A)		(%)							
8	Glyphosate +	1.0	14-DPP	98	75	100	96	94	75	100	100
	clomazone *fb*	0.3	14-DPP								
	propanil	3.0	EPOST								
9	Glufosinate +	0.31	14-DPP	100	79	100	98	99	83	100	96
	clomazone *fb*	0.3	14-DPP								
	glufosinate	0.31	EPOST								
10	Paraquat +	0.625	7-DPP	100	98	100	98	100	98	100	98
	clomazone +	0.3	7-DPP								
	AG-98 *fb*	0.25	7-DPP								
	propanil	3.0	EPOST								
11	(Imazethapyr +										
	glyphosate)	0.813	14-DPP	92	70	85	83	79	69	88	85
12	Glyphosate +	1.0	14-DPP	86	88	100	98	80	90	100	100
	clomazone *fb*	0.4	14-DPP								
	propanil	3.0	EPOST								
13	Glufosinate +	0.31	14-DPP	98	78	100	100	99	85	100	100
	clomazone *fb*	0.4	14-DPP								
	glufosinate	0.31	EPOST								
14	Paraquat +	0.625	7-DPP	100	98	100	100	100	98	100	100
	clomazone +	0.4	7-DPP								
	AG-98 *fb*	0.25	7-DPP								
	propanil	3.0	EPOST								
15	(Imazethapyr +										
	glyphosate)	0.813	14-DPP	86	93	94	88	87	93	95	96
16	Glyphosate +	1.0	14-DPP	96	94	100	99	94	96	100	99
	clomazone *fb*	0.6	14-DPP								
	propanil	3.0	EPOST								
17	Glufosinate +	0.31	14-DPP	99	94	100	100	100	89	100	99
	clomazone *fb*	0.6	14-DPP								
	glufosinate	0.31	EPOST								
18	Paraquat +	0.625	7-DPP	100	97	100	100	100	99	100	100
	clomazone +	0.6	7-DPP								
	AG-98 *fb*	0.25	7-DPP								
	propanil	3.0	EPOST								
19	(Imazethapyr +										
	glyphosate) *fb*	0.813	14-DPP	90	88	100	98	77	88	100	97
	propanil	3.0	EPOST								
20	Glyphosate +	1.0	14-DPP	93	91	100	100	87	89	100	99
	clomazone *fb*	0.8	14-DPP								
	propanil	3.0	EPOST								
21	Glufosinate +	0.31	14-DPP	100	90	100	100	100	93	100	96
	clomazone *fb*	0.8	14-DPP								
	glufosinate	0.31	EPOST								
22	Paraquat +	0.625	7-DPP	100	100	100	100	100	100	100	100
	clomazone +	0.8	7-DPP								
	AG-98 *fb*	0.25	7-DPP								
	propanil	3.0	EPOST								
23	(Imazethapyr +										
	glyphosate) *fb*	0.813	14-DPP	93	65	100	95	84	65	100	98
	propanil	3.0	EPOST								
	LSD (0.05)			8	35	9	17	13	36	8	18

Table 9. Propanil and bispyribac-sodium herbicide programs, Stuttgart, 2000.

SUMMARY

The use of propanil (Stam M-4) or bispyribac-sodium (Regiment) following clomazone (Command) or thiobencarb (Bolero) was evaluated. Propanil and bispyribac-sodium were applied at 2- to 3-leaf, 4- to 5-leaf, 5- to 6-leaf rice stages, or the postflood application timing. Propanil tank-mixed with clomazone at 0.3 lb ai/A, pendimethalin (Prowl) at 1.0 lb ai/A, and quinclorac (Facet) at 0.25 lb ai/A applied at the 4- to 5-leaf rice stage were evaluated. Standard programs included a total postemergence program of quinclorac (Facet) plus propanil applied at the 4- to 5-leaf rice stage or clomazone + quinclorac applied preemergence followed by propanil + triclopyr (Grandstand) at the 5- to 6-leaf rice stage.

Programs with clomazone or thiobencarb applied preemergence generally gave better control of propanil-resistant and -susceptible barnyardgrass than total postemergence programs. When propanil or bispyribac-sodium was applied with clomazone or quinclorac, broadleaf signalgrass control was obtained. Only those programs including quinclorac controlled pitted or tall morningglory. Northern jointvetch and hemp sesbania were controlled only with programs that included propanil, quinclorac, or bispyribac-sodium.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 5.2
Planting date ..... May 17, 2000
Harvest date ..... September 21, 2000
Crop / Variety ..... rice / Wells
Dates of flushing ..... June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; MPOST = midpostemergence; PREFL = preflood; and POFL = post-flood.

Application type	PRE	DPRE	EPOST	MPOST	PREFL	POFL
Date applied	May 18, 2000	May 22, 2000	June 2, 2000	June 12, 2000	June 19, 2000	July 5, 2000
Time	10:00 am	4:30 pm	2:30 pm	7:00 pm	10:00 am	2:00 pm
Incorporation equipment	N/A	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	82 / 78	88 / 77	95 / 92	84 / 84	93 / 84	95 / 88
Relative humidity (%)	83	84	42	62	85	89
Wind (mph)	3	4	2	3	1	2
Cloud cover (%)	20	100	15	40	50	30
Soil moisture	adequate	adequate	adequate	adequate	adequate	flood
Crop stage/Height	N/A	N/A	2-3 lf / 5.5"	4 lf / 8"	5-6 lf / 10"	7-8 lf / 18"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 2
Nozzle type/Size	T-Jet DG / 110015	T-Jet / DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet XR / 11002
Boom ht / # Noz / Spacing (in.)	16 / 3 / 18	16 / 3 / 18	20 / 3 / 18	25 / 3 / 18	29 / 3 / 18	34 / 3 / 18
Gpa / Psi	15 / 38	15 / 38	15 / 36	15 / 38	15 / 38	15 / 24
Weed species (density)	---------- [# leaves/height (in.)] ----------					
S-ECHCG (13/ft in row)	N/A	N/A	1 lf / 1-2"	3-4 lf / 2-3"	5 lf / 8-10"	7-8 lf / 13-15"
R-ECHCG (15/ft in row)	N/A	N/A	1-2 lf / 2"	4 lf / 4-5"	5-6 lf / 9-10"	9-10 lf / 14-16"
BRAPP (20/ft in row)	N/A	N/A	1 lf / 1-1.5"	4-5 lf / 3-3.5"	9-10 lf / 4-5"	16-19 lf / 8-9"
IPOLA (20/ft in row)	N/A	N/A	2 lf / 2-2.5"	5-6 lf / 5"	7-8 lf / 6-7"	15+ lf / 10-12"
PHBPU (15/ft in row)	N/A	N/A	2 lf / 1-2"	3-4 lf / 2-3"	6-8 lf / 5-6"	10-14 lf / 10-12"
AESVI (10/ft in row)	N/A	N/A	1-2 lf / 2-2.5"	4-5 lf / 3.5-4"	7-8 lf / 5"	10-12 lf / 9-11"
SEBEX (40/ft in row)	N/A	N/A	2-3 lf / 3-4"	5 lf / 8-9"	8 lf / 10-12"	11-13 lf / 15-18"
N-ECHCG (8-10/ft^2)	N/A	N/A	2-3 lf / 2-2.5"	4-5 lf / 5-6"	5-6 lf / 9-10"	9-10 lf / 14-16"

Table 9. Section 1.

				Barnyardgrass control							
				Susceptible (S-ECHCG)				Resistant (R-ECHCG)			
	Herbicide	Rate	Application timing	6/1	6/16	7/18	8/17	6/1	6/16	7/18	8/17
			(lb ai/A)	(%)							
1	Untreated check			0	0	0	0	0	0	0	0
2	Clomazone	0.3	PRE	100	100	100	100	98	100	100	100
3	Clomazone *fb*	0.3	PRE	100	100	100	100	99	100	100	100
	propanil	4.0	MPOST								
4	Clomazone *fb*	0.3	PRE	100	100	100	100	99	100	100	100
	propanil +	4.0	MPOST								
	quinclorac	0.25	MPOST								
5	Clomazone *fb*	0.3	PRE	100	100	100	100	100	100	100	100
	propanil +	4.0	MPOST								
	pendimethalin	1.0	MPOST								
6	Propanil	4.0	EPOST	0	46	39	51	0	34	15	43
7	Propanil	4.0	MPOST	0	5	15	34	0	8	15	30
8	Propanil *fb*	4.0	EPOST	0	76	33	48	0	40	24	48
	propanil	4.0	MPOST								
9	Propanil +	4.0	MPOST	0	49	28	58	0	19	28	53
	quinclorac	0.25	MPOST								
10	Propanil +	4.0	MPOST	0	31	23	55	0	8	5	48
	pendimethalin	1.0	MPOST								
11	Propanil +	4.0	MPOST	0	36	28	55	0	9	23	58
	clomazone	0.3	MPOST								
12	Clomazone *fb*	0.3	PRE	100	100	100	100	100	100	100	100
	bispyribac-sodium +	0.019	MPOST								
	Kinetic	0.125%	MPOST								
13	Clomazone *fb*	0.3	PRE	100	100	100	100	98	100	100	100
	bispyribac-sodium +	0.019	PREFL								
	Kinetic	0.125%	PREFL								
14	Clomazone *fb*	0.3	PRE	100	100	100	100	99	100	100	100
	bispyribac-sodium +	0.019	POFL								
	Kinetic	0.125%	POFL								
15	Clomazone *fb*	0.3	PRE	100	100	100	100	100	100	100	100
	(propanil + molinate)	4.5	MPOST								
16	Clomazone *fb*	0.3	PRE	100	100	100	100	100	100	100	100
	(propanil + molinate)	4.5	PREFL								
17	Clomazone *fb*	0.3	PRE	100	100	100	100	99	100	100	98
	molinate +	3.0	POFL								
	bensulfuron	0.0375	POFL								
18	Thiobencarb *fb*	3.0	DPRE	99	100	78	73	96	100	55	86
	bispyribac-sodium +	0.019	MPOST								
	Kinetic	0.125%	MPOST								
19	Thiobencarb *fb*	3.0	DPRE	100	96	100	98	100	98	100	95
	bispyribac-sodium +	0.019	PREFL								
	Kinetic	0.125%	PREFL								
20	Thiobencarb *fb*	3.0	DPRE	100	90	100	100	99	95	100	100
	bispyribac-sodium +	0.019	POFL								
	Kinetic	0.125%	POFL								
21	Clomazone +	0.3	PRE	100	100	100	100	100	100	100	100
	quinclorac *fb*	0.25	PRE								
	propanil +	2.0	PREFL								
	triclopyr	0.25	PREFL								
	LSD (0.05)			1	14	10	7	3	14	10	8

continued

Table 9. Section 2.

				Weed control								
				Natural barnyardgrass (N-ECHCG)			Broadleaf signalgrass (BRAPP)				Tall morningglory (PHBPU)	
	Herbicide	Rate	Application timing	6/1	6/16	7/18	6/1	6/16	7/18	8/17	6/16	7/18
		(lb ai/A)		(%)								
1	Untreated check			0	0	0	0	0	0	0	0	0
2	Clomazone	0.3	PRE	100	100	100	89	100	100	100	0	25
3	Clomazone *fb* propanil	0.3 4.0	PRE MPOST	100	100	100	88	100	100	100	28	18
4	Clomazone *fb* propanil + quinclorac	0.3 4.0 0.25	PRE MPOST MPOST	100	100	100	90	100	100	100	71	100
5	Clomazone *fb* propanil + pendimethalin	0.3 4.0 1.0	PRE MPOST MPOST	100	100	100	89	100	100	100	38	48
6	Propanil	4.0	EPOST	46	23	51	0	86	89	100	35	15
7	Propanil	4.0	MPOST	33	10	34	1	1	66	100	23	10
8	Propanil *fb* propanil	4.0 4.0	EPOST MPOST	43	28	48	0	90	88	100	44	13
9	Propanil + quinclorac	4.0 0.25	MPOST MPOST	38	33	58	0	9	78	78	74	99
10	Propanil + pendimethalin	4.0 1.0	MPOST MPOST	43	45	55	0	18	78	74	50	10
11	Propanil + clomazone	4.0 0.3	MPOST MPOST	50	23	55	0	19	73	83	21	10
12	Clomazone *fb* bispyribac-sodium + Kinetic	0.3 0.019 0.125%	PRE MPOST MPOST	100	100	100	91	100	100	100	21	13
13	Clomazone *fb* bispyribac-sodium + Kinetic	0.3 0.019 0.125%	PRE PREFL PREFL	100	100	100	90	100	99	100	3	30
14	Clomazone *fb* bispyribac-sodium + Kinetic	0.3 0.019 0.125%	PRE POFL POFL	100	100	100	88	100	100	100	3	25
15	Clomazone *fb* (propanil + molinate)	0.3 4.5	PRE MPOST	100	100	100	91	100	100	100	20	13
16	Clomazone *fb* (propanil + molinate)	0.3 4.5	PRE PREFL	100	100	100	90	100	100	100	18	20
17	Clomazone *fb* molinate + bensulfuron	0.3 3.0 0.0375	PRE POFL POFL	100	100	100	86	100	98	100	3	45
18	Thiobencarb *fb* bispyribac-sodium + Kinetic	3.0 0.019 0.125%	DPRE MPOST MPOST	70	53	73	89	14	28	10	3	10
19	Thiobencarb *fb* bispyribac-sodium + Kinetic	3.0 0.019 0.125%	DPRE PREFL PREFL	100	100	98	8	0	15	10	15	25
20	Thiobencarb *fb* bispyribac-sodium + Kinetic	3.0 0.019 0.125%	DPRE POFL POFL	50	100	100	1	0	8	0	0	20
21	Clomazone + quinclorac *fb* propanil + triclopyr	0.3 0.25 2.0 0.25	PRE PRE PREFL PREFL	100	100	100	89	100	100	100	1	100
	LSD (0.05)			18	10	7	6	5	13	12	24	13

continued

Table 9. Section 3.

				Weed control					
			Application	Pitted morningglory (IPOLA)			Northern jointvetch (AESVI)		
	Herbicide	Rate	timing	6/16	7/18	8/17	6/16	7/18	8/17
			(lb ai/A)	---------- (%) ----------					
1	Untreated check			0	0	0	0	0	0
2	Clomazone	0.3	PRE	0	23	0	0	10	0
3	Clomazone *fb*	0.3	PRE	10	18	0	90	38	45
	propanil	4.0	MPOST						
4	Clomazone *fb*	0.3	PRE	69	100	100	91	100	98
	propanil +	4.0	MPOST						
	quinclorac	0.25	MPOST						
5	Clomazone *fb*	0.3	PRE	31	49	60	85	82	78
	propanil +	4.0	MPOST						
	pendimethalin	1.0	MPOST						
6	Propanil	4.0	EPOST	10	19	39	86	64	76
7	Propanil	4.0	MPOST	18	10	25	54	68	90
8	Propanil *fb*	4.0	EPOST	34	15	40	91	92	95
	propanil	4.0	MPOST						
9	Propanil +	4.0	MPOST	69	98	100	73	95	96
	quinclorac	0.25	MPOST						
10	Propanil +	4.0	MPOST	10	10	0	69	79	73
	pendimethalin	1.0	MPOST						
11	Propanil +	4.0	MPOST	14	10	0	74	96	96
	clomazone	0.3	MPOST						
12	Clomazone *fb*	0.3	PRE	13	10	10	46	85	88
	bispyribac-sodium +	0.019	MPOST						
	Kinetic	0.125%	MPOST						
13	Clomazone *fb*	0.3	PRE	1	33	28	0	91	95
	bispyribac-sodium +	0.019	PREFL						
	Kinetic	0.125%	PREFL						
14	Clomazone *fb*	0.3	PRE	3	25	53	0	90	100
	bispyribac-sodium +	0.019	POFL						
	Kinetic	0.125%	POFL						
15	Clomazone *fb*	0.3	PRE	13	13	13	85	82	84
	(propanil + molinate)	4.5	MPOST						
16	Clomazone *fb*	0.3	PRE	0	20	23	0	96	100
	(propanil + molinate)	4.5	PREFL						
17	Clomazone *fb*	0.3	PRE	5	80	98	0	43	73
	molinate +	3.0	POFL						
	bensulfuron	0.0375	POFL						
18	Thiobencarb *fb*	3.0	DPRE	3	10	8	0	48	43
	bispyribac-sodium +	0.019	MPOST						
	Kinetic	0.125%	MPOST						
19	Thiobencarb *fb*	3.0	DPRE	0	25	18	0	94	98
	bispyribac-sodium +	0.019	PREFL						
	Kinetic	0.125%	PREFL						
20	Thiobencarb *fb*	3.0	DPRE	0	20	0	0	65	94
	bispyribac-sodium +	0.019	POFL						
	Kinetic	0.125%	POFL						
21	Clomazone +	0.3	PRE	0	100	100	0	100	100
	quinclorac *fb*	0.25	PRE						
	propanil +	2.0	PREFL						
	triclopyr	0.25	PREFL						
	LSD (0.05)			14	15	17	15	19	22

continued

Table 9. Section 4.

				Weed control			Effect on rice		
				Hemp sesbania (SEBEX)			Chlorosis		
	Herbicide	Rate	Application timing	6/16	7/18	8/17	6/1	6/5	6/29
			(lb ai/A)	(%)					
1	Untreated check			0	0	0	0	0	0
2	Clomazone	0.3	PRE	0	10	0	9	11	0
3	Clomazone *fb*	0.3	PRE	76	91	98	8	10	0
	propanil	4.0	MPOST						
4	Clomazone *fb*	0.3	PRE	85	100	100	9	7	0
	propanil +	4.0	MPOST						
	quinclorac	0.25	MPOST						
5	Clomazone *fb*	0.3	PRE	85	87	93	9	4	0
	propanil +	4.0	MPOST						
	pendimethalin	1.0	MPOST						
6	Propanil	4.0	EPOST	100	90	93	0	0	0
7	Propanil	4.0	MPOST	64	85	95	0	0	0
8	Propanil *fb*	4.0	EPOST	100	90	90	0	0	0
	propanil	4.0	MPOST						
9	Propanil +	4.0	MPOST	79	99	100	0	0	0
	quinclorac	0.25	MPOST						
10	Propanil +	4.0	MPOST	71	90	96	0	0	0
	pendimethalin	1.0	MPOST						
11	Propanil +	4.0	MPOST	66	96	100	0	0	0
	clomazone	0.3	MPOST						
12	Clomazone *fb*	0.3	PRE	13	64	88	5	7	0
	bispyribac-sodium +	0.019	MPOST						
	Kinetic	0.125%	MPOST						
13	Clomazone *fb*	0.3	PRE	0	84	95	4	3	0
	bispyribac-sodium +	0.019	PREFL						
	Kinetic	0.125%	PREFL						
14	Clomazone *fb*	0.3	PRE	0	50	76	8	5	0
	bispyribac-sodium +	0.019	POFL						
	Kinetic	0.125%	POFL						
15	Clomazone *fb*	0.3	PRE	81	76	81	4	6	0
	(propanil + molinate)	4.5	MPOST						
16	Clomazone *fb*	0.3	PRE	0	97	100	8	4	0
	(propanil + molinate)	4.5	PREFL						
17	Clomazone *fb*	0.3	PRE	0	45	46	5	3	0
	molinate +	3.0	POFL						
	bensulfuron	0.0375	POFL						
18	Thiobencarb *fb*	3.0	DPRE	23	55	66	0	0	0
	bispyribac-sodium +	0.019	MPOST						
	Kinetic	0.125%	MPOST						
19	Thiobencarb *fb*	3.0	DPRE	0	91	94	0	0	0
	bispyribac-sodium +	0.019	PREFL						
	Kinetic	0.125%	PREFL						
20	Thiobencarb *fb*	3.0	DPRE	0	53	65	0	0	0
	bispyribac-sodium +	0.019	POFL						
	Kinetic	0.125%	POFL						
21	Clomazone +	0.3	PRE	0	100	100	4	9	0
	quinclorac *fb*	0.25	PRE						
	propanil +	2.0	PREFL						
	triclopyr	0.25	PREFL						
	LSD (0.05)			12	16	14	6	6	0

continued

Table 9. Section 5.

				Effect on rice						
				Biomass reduction			Injury			Yield
	Herbicide	Rate	Application timing	6/1	6/5	6/29	6/1	6/5	6/29	9/21
		(lb ai/A)		---------- (%) ----------						(lb/A)
1	Untreated check			0	0	0	0	0	0	638
2	Clomazone	0.3	PRE	0	0	0	0	0	0	5717
3	Clomazone *fb*	0.3	PRE	0	0	0	0	0	0	7727
	propanil	4.0	MPOST							
4	Clomazone *fb*	0.3	PRE	0	0	0	0	0	0	8119
	propanil +	4.0	MPOST							
	quinclorac	0.25	MPOST							
5	Clomazone *fb*	0.3	PRE	0	0	0	0	0	1	7319
	propanil +	4.0	MPOST							
	pendimethalin	1.0	MPOST							
6	Propanil	4.0	EPOST	0	0	0	0	0	0	3005
7	Propanil	4.0	MPOST	0	0	0	0	0	0	583
8	Propanil *fb*	4.0	EPOST	0	0	0	0	0	0	2635
	propanil	4.0	MPOST							
9	Propanil +	4.0	MPOST	0	0	0	0	0	0	3652
	quinclorac	0.25	MPOST							
10	Propanil +	4.0	MPOST	0	0	0	0	0	0	2431
	pendimethalin	1.0	MPOST							
11	Propanil +	4.0	MPOST	0	0	0	0	0	0	3688
	clomazone	0.3	MPOST							
12	Clomazone *fb*	0.3	PRE	0	0	0	0	0	0	8001
	bispyribac-sodium +	0.019	MPOST							
	Kinetic	0.125%	MPOST							
13	Clomazone *fb*	0.3	PRE	0	0	0	0	0	0	7719
	bispyribac-sodium +	0.019	PREFL							
	Kinetic	0.125%	PREFL							
14	Clomazone *fb*	0.3	PRE	0	0	0	0	0	0	7461
	bispyribac-sodium +	0.019	POFL							
	Kinetic	0.125%	POFL							
15	Clomazone *fb*	0.3	PRE	0	0	0	0	0	1	8254
	(propanil + molinate)	4.5	MPOST							
16	Clomazone *fb*	0.3	PRE	0	0	0	0	0	3	7603
	(propanil + molinate)	4.5	PREFL							
17	Clomazone *fb*	0.3	PRE	0	0	0	0	0	0	7010
	molinate +	3.0	POFL							
	bensulfuron	0.0375	POFL							
18	Thiobencarb *fb*	3.0	DPRE	0	0	0	0	0	0	5158
	bispyribac-sodium +	0.019	MPOST							
	Kinetic	0.125%	MPOST							
19	Thiobencarb *fb*	3.0	DPRE	0	0	0	0	0	0	6710
	bispyribac-sodium +	0.019	PREFL							
	Kinetic	0.125%	PREFL							
20	Thiobencarb *fb*	3.0	DPRE	0	0	0	0	0	0	6432
	bispyribac-sodium +	0.019	POFL							
	Kinetic	0.125%	POFL							
21	Clomazone +	0.3	PRE	0	0	0	0	0	0	8004
	quinclorac *fb*	0.25	PRE							
	propanil +	2.0	PREFL							
	triclopyr	0.25	PREFL							
	LSD (0.05)			0	0	0	0	0	2	1428

Table 10. Bispyribac-sodium in a complete weed control program, Stuttgart, 2000.

SUMMARY

Bispyribac-sodium (Regiment) was evaluated in a program with the soil-applied herbicides clomazone (Command) at 0.3 lb ai/A applied preemergence, pendimethalin (Prowl) at 1.0 lb ai/A applied delayed preemergence, or thiobencarb (Bolero) at 3.0 lb ai/A applied delayed preemergence. Bispyribac-sodium was applied at 9.0 g ai/A at 4- to 5-leaf, 5- to 6-leaf, or postflood timings. Bispyribac-sodium was also evaluated in a total postemergence program with other rice herbicides including triclopyr (Grandstand), propanil + molinate (Arrosolo), propanil (Stam M-4), or molinate (Ordram). These were applied at labeled rates and at various application timings.

Bispyribac-sodium following a preemergence herbicide controlled propanil-resistant and -susceptible barnyardgrass 90 to 100%. Bispyribac-sodium applied alone failed to control broadleaf signalgrass (38%); however, when used in a program with clomazone or propanil broadleaf signalgrass control was attained (>93%). Pitted and tall morningglory control was limited to programs with triclopyr. Northern jointvetch and hemp sesbania were controlled 87 to 100% and 71 to 100%, respectively, with all programs containing bispyribac-sodium. Bearded sprangletop control was obtained with all programs; however, at the time of postemergence application, plants were extremely small, and control would have been less likely with larger plants.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 5.2
Planting date ..... May 17, 2000
Harvest date ..... September 21, 2000
Crop / Variety ..... rice / Wells
Dates of flushing ..... June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: PRE = preemergence; DPRE = delayed preemergence; EPOST = early postemergence; MPOST = midpostemergence; PREFL = preflood; and POFL = postflood.

Application type	PRE	DPRE	EPOST	MPOST	PREFL	POFL
Date applied	May 18, 2000	May 22, 2000	June 2, 2000	June 12, 2000	June 19, 2000	July 5, 2000
Time	10:00 am	4:30 pm	2:30 pm	7:00 pm	10:00 am	2:00 pm
Incorporation equipment	N/A	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	82 / 78	88 / 77	95 / 92	84 / 84	93 / 84	95 / 88
Relative humidity (%)	83	84	42	62	85	89
Wind (mph)	3	4	2	3	1	2
Cloud cover (%)	20	100	15	40	50	30
Soil moisture	adequate	adequate	adequate	adequate	adequate	flood
Crop stage/Height	N/A	N/A	2 lf / 5"	4 lf / 8"	5-6 lf / 11"	7-8 lf / 18"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 11001
Boom ht / # Noz / Spacing (in.)	16 / 3 / 18	16 / 3 / 18	16 / 3 / 18	16 / 3 / 18	16 / 3 / 18	16 / 3 / 18
Gpa / Psi	10 / 25	10 / 25	10 / 24	10 / 22	10 / 25	10 / 28
Weed species (density)	---------- [# leaves/height (in.)] ----------					
R-ECHCG (9/ft in row)	N/A	N/A	1-2 lf / 0.5"	4-5 lf / 4.5-5"	5 lf / 8-9"	7-8 lf / 13-15"
S-ECHCG (10/ft in row)	N/A	N/A	1 lf / 0.5"	4 lf / 3.5-4"	5 lf / 7-9"	6-7 lf / 13-14"
N-ECHCG (8-10/ft^2)	N/A	N/A	2 lf / 0.5"	4-5 lf / 4.5-5"	5-6 lf / 8-9"	7-8 lf / 13-15"
BRAPP (14/ft in row)	N/A	N/A	1 lf / 0.5"	3-4 lf / 2-3"	6-7 lf / 4-6"	8-11 lf / 8-9"
SEBEX (30/ft in row)	N/A	N/A	2-3 lf / 2-3"	6 lf / 8-10"	8-10 lf / 8-10"	11-13 lf / 15-18"
AESVI (3/ft in row)	N/A	N/A	1 lf / 2"	3-4 lf / 2-3"	5 lf / 3-4"	10-12 lf / 9-11"
IPOLA (10/ft in row)	N/A	N/A	1-2 lf / 0.5"	5 lf / 5.5"	5-6 lf / 6-7"	15+ lf / 9-11"
PHBPU (10/ft in row)	N/A	N/A	1 lf / 0.5"	3 lf / 3-4"3"	4-5 lf / 5-6"	10-12 lf / 8-10"
LEFFA (0.3/ft^2)	N/A	N/A	N/A	N/A	1 lf / 0.5"	1-2 lf / 1.5"

Table 10. Section 1.

				Barnyardgrass control							
			Application	Natural (N-ECHCG)				Susceptible (S-ECHCG)			
	Herbicide	Rate	timing	6/1	6/15	7/18	8/17	6/1	6/15	7/18	8/17
		(lb ai/A)		---------- (%) ----------							
1	Untreated check			0	0	0	0	0	0	0	0
2	Bispyribac-sodium +	0.019	MPOST	0	18	63	59	0	15	84	60
	Kinetic	0.125%	MPOST								
	triclopyr	0.28	POFL								
3	(Propanil + molinate) *fb*	4.5	MPOST	0	73	74	63	0	61	85	63
	triclopyr	0.28	POFL								
4	Bispyribac-sodium +	0.019	MPOST	0	15	83	83	0	18	100	86
	Kinetic *fb*	0.125%	MPOST								
	bispyribac-sodium +	0.019	PREFL								
	Kinetic	0.125%	PREFL								
5	Propanil *fb*	3.0	EPOST	0	81	63	58	0	78	83	64
	(propanil + molinate)	4.0	PREFL								
6	Bispyribac-sodium +	0.019	MPOST	0	15	88	99	0	20	95	99
	Kinetic *fb*	0.125%	MPOST								
	bispyribac-sodium +	0.026	POFL								
	Kinetic	0.125%	POFL								
7	(Propanil + molinate) *fb*	4.5	MPOST	0	79	93	88	0	79	95	88
	molinate +	3.0	POFL								
	bensulfuron +	0.0375	POFL								
	Agri-Dex	1%	POFL								
8	Pendimethalin *fb*	1.0	DPRE	100	100	100	98	100	100	100	95
	bispyribac-sodium +	0.017	MPOST								
	Kinetic	0.125%	MPOST								
9	Pendimethalin *fb*	1.0	DPRE	100	100	100	100	100	100	100	100
	bispyribac-sodium +	0.019	MPOST								
	Kinetic	0.125%	MPOST								
10	Pendimethalin *fb*	1.0	DPRE	100	100	100	100	100	100	100	100
	(propanil + molinate)	4.5	MPOST								
11	Clomazone *fb*	0.3	PRE	96	100	100	100	96	100	100	100
	bispyribac-sodium +	0.019	PREFL								
	Kinetic	0.125%	PREFL								
12	Clomazone *fb*	0.3	PRE	99	100	100	100	99	100	100	100
	bispyribac-sodium +	0.019	POFL								
	Kinetic	0.125%	POFL								
13	Clomazone *fb*	0.3	PRE	97	100	100	100	97	100	100	100
	(propanil + molinate)	4.5	PREFL								
14	Clomazone *fb*	0.3	PRE	98	100	100	100	98	100	100	100
	molinate +	3.0	POFL								
	bensulfuron +	0.0375	POFL								
	Agri-Dex	1%	POFL								
15	Thiobencarb *fb*	3.0	DPRE	100	89	90	90	100	86	93	90
	bispyribac-sodium +	0.019	MPOST								
	Kinetic	0.125%	MPOST								
16	Thiobencarb *fb*	3.0	DPRE	99	98	98	98	99	98	98	98
	(propanil + molinate)	4.5	MPOST								
17	Pendimethalin *fb*	1.0	DPRE	100	100	100	100	100	100	100	100
	bispyribac-sodium +	0.019	POFL								
	Kinetic	0.125%	POFL								
18	Pendimethalin *fb*	1.0	DPRE	100	100	96	96	100	100	100	96
	molinate	3.0	POFL								
19	Pendimethalin *fb*	1.0	DPRE	100	100	100	100	100	100	100	100
	bispyribac-sodium +	0.019	POFL								
	triclopyr +	0.28	POFL								
	Kinetic	0.125%	POFL								

continued

Table 10. Section 1. Continued.

				Barnyardgrass control							
				Natural (N-ECHCG)				Susceptible (S-ECHCG)			
	Herbicide	Rate	Application timing	6/1	6/15	7/18	8/17	6/1	6/15	7/18	8/17
		(lb ai/A)		(%)							
20	Pendimethalin *fb*	1.0	DPRE	100	100	100	100	100	100	100	100
	molinate +	3.0	POFL								
	triclopyr	0.28	POFL								
21	Thiobencarb +	2.0	EPOST	0	98	100	98	0	100	100	98
	propanil *fb*	3.0	EPOST								
	thiobencarb +	2.0	PREFL								
	bispyribac-sodium	0.019	PREFL								
	LSD (0.05)			3	16	11	14	3	17	9	12

continued

Table 10. Section 2.

				Weed control							
				Resistant barnyardgrass (R-ECHCG)				Broadleaf signalgrass (BRAPP)			
	Herbicide	Rate	Application timing	6/1	6/15	7/18	8/17	6/1	6/15	7/18	8/17
		(lb ai/A)		(%)							
1	Untreated check			0	0	0	0	0	0	0	0
2	Bispyribac-sodium +	0.019	MPOST	0	15	68	63	0	10	30	43
	Kinetic	0.125%	MPOST								
	triclopyr	0.28	POFL								
3	(Propanil + molinate) *fb*	4.5	MPOST	0	20	53	55	0	28	68	50
	triclopyr	0.28	POFL								
4	Bispyribac-sodium +	0.019	MPOST	0	23	90	95	10	10	35	38
	Kinetic *fb*	0.125%	MPOST								
	bispyribac-sodium +	0.019	PREFL								
	Kinetic	0.125%	PREFL								
5	Propanil *fb*	3.0	EPOST	0	38	40	53	24	30	100	100
	(propanil + molinate)	4.0	PREFL								
6	Bispyribac-sodium +	0.019	MPOST	0	15	91	100	0	10	25	28
	Kinetic *fb*	0.125%	MPOST								
	bispyribac-sodium +	0.026	POFL								
	Kinetic	0.125%	POFL								
7	(Propanil + molinate) *fb*	4.5	MPOST	0	40	88	98	25	45	70	65
	molinate +	3.0	POFL								
	bensulfuron +	0.0375	POFL								
	Agri-Dex	1%	POFL								
8	Pendimethalin *fb*	1.0	DPRE	100	100	100	100	100	90	90	80
	bispyribac-sodium +	0.017	MPOST								
	Kinetic	0.125%	MPOST								
9	Pendimethalin *fb*	1.0	DPRE	100	100	100	100	100	98	98	85
	bispyribac-sodium +	0.019	MPOST								
	Kinetic	0.125%	MPOST								
10	Pendimethalin *fb*	1.0	DPRE	100	100	100	100	100	99	96	96
	(propanil + molinate)	4.5	MPOST								
11	Clomazone *fb*	0.3	PRE	96	100	100	100	94	100	100	100
	bispyribac-sodium +	0.019	PREFL								
	Kinetic	0.125%	PREFL								

continued

Table 10. Section 2. Continued.

	Herbicide	Rate	Application timing	Weed control: Resistant barnyardgrass (R-ECHCG) 6/1	6/15	7/18	8/17	Broadleaf signalgrass (BRAPP) 6/1	6/15	7/18	8/17
		(lb ai/A)		(%)							
12	Clomazone *fb*	0.3	PRE	100	100	100	100	95	100	100	100
	bispyribac-sodium +	0.019	POFL								
	Kinetic	0.125%	POFL								
13	Clomazone *fb*	0.3	PRE	97	100	100	100	96	100	100	100
	(propanil + molinate)	4.5	PREFL								
14	Clomazone *fb*	0.3	PRE	99	100	100	100	91	100	100	100
	molinate +	3.0	POFL								
	bensulfuron +	0.0375	POFL								
	Agri-Dex	1%	POFL								
15	Thiobencarb *fb*	3.0	DPRE	100	86	90	94	98	61	65	70
	bispyribac-sodium +	0.019	MPOST								
	Kinetic	0.125%	MPOST								
16	Thiobencarb *fb*	3.0	DPRE	100	100	98	100	97	72	99	93
	(propanil + molinate)	4.5	MPOST								
17	Pendimethalin *fb*	1.0	DPRE	100	100	100	100	100	98	96	85
	bispyribac-sodium +	0.019	POFL								
	Kinetic	0.125%	POFL								
18	Pendimethalin *fb*	1.0	DPRE	100	100	100	100	100	91	95	83
	molinate	3.0	POFL								
19	Pendimethalin *fb*	1.0	DPRE	100	100	100	100	100	95	80	63
	bispyribac-sodium +	0.019	POFL								
	triclopyr +	0.28	POFL								
	Kinetic	0.125%	POFL								
20	Pendimethalin *fb*	1.0	DPRE	100	100	100	100	100	95	80	73
	molinate +	3.0	POFL								
	triclopyr	0.28	POFL								
21	Thiobencarb +	2.0	EPOST	0	96	100	100	0	91	100	95
	propanil *fb*	3.0	EPOST								
	thiobencarb +	2.0	PREFL								
	bispyribac-sodium	0.019	PREFL								
	LSD (0.05)			2	12	12	7	22	13	21	27

continued

Table 10. Section 3.

	Herbicide	Rate	Application timing	Weed control: Tall morningglory (PHBPU) 6/1	6/15	7/18	Pitted morningglory (IPOLA) 6/1	6/15	7/18	Northern jointvetch (AESVI) 6/15	7/18	8/17
		(lb ai/A)		(%)								
1	Untreated check			0	0	0	0	0	0	0	0	0
2	Bispyribac-sodium +	0.019	MPOST	0	30	100	0	25	100	0	100	100
	Kinetic	0.125%	MPOST									
	triclopyr	0.28	POFL									
3	(Propanil + molinate) *fb*	4.5	MPOST	0	35	100	0	35	100	66	100	100
	triclopyr	0.28	POFL									
4	Bispyribac-sodium +	0.019	MPOST	0	0	30	0	0	33	0	100	99
	Kinetic *fb*	0.125%	MPOST									
	bispyribac-sodium +	0.019	PREFL									
	Kinetic	0.125%	PREFL									

continued

Table 10. Section 3. Continued.

				Weed control								
				Tall morningglory (PHBPU)			Pitted morningglory (IPOLA)			Northern jointvetch (AESVI)		
	Herbicide	Rate	Application timing	6/15	7/18	6/1	6/15	7/18	6/15	7/18	8/17	
		(lb ai/A)		---------- (%) ----------								
5	Propanil *fb* (propanil + molinate)	3.0 4.0	EPOST PREFL	0	40	70	0	40	70	98	100	100
6	Bispyribac-sodium + Kinetic *fb* bispyribac-sodium + Kinetic	0.019 0.125% 0.026 0.125%	MPOST MPOST POFL POFL	0	18	45	0	20	48	0	100	100
7	(Propanil + molinate) *fb* molinate + bensulfuron + Agri-Dex	4.5 3.0 0.0375 1%	MPOST POFL POFL POFL	0	36	63	0	33	63	78	91	81
8	Pendimethalin *fb* bispyribac-sodium + Kinetic	1.0 0.017 0.125%	DPRE MPOST MPOST	0	33	33	0	30	33	0	100	100
9	Pendimethalin *fb* bispyribac-sodium + Kinetic	1.0 0.019 0.125%	DPRE MPOST MPOST	0	28	33	0	30	30	0	79	88
10	Pendimethalin *fb* (propanil + molinate)	1.0 4.5	DPRE MPOST	0	28	45	0	28	45	85	65	68
11	Clomazone *fb* bispyribac-sodium + Kinetic	0.3 0.019 0.125%	PRE PREFL PREFL	0	0	45	0	0	45	0	98	100
12	Clomazone *fb* bispyribac-sodium + Kinetic	0.3 0.019 0.125%	PRE POFL POFL	0	0	43	0	0	43	0	100	98
13	Clomazone *fb* (propanil + molinate)	0.3 4.5	PRE PREFL	0	15	43	0	13	38	0	100	98
14	Clomazone *fb* molinate + bensulfuron + Agri-Dex	0.3 3.0 0.0375 1%	PRE POFL POFL POFL	0	0	25	0	0	30	0	90	95
15	Thiobencarb *fb* bispyribac-sodium + Kinetic	3.0 0.019 0.125%	DPRE MPOST MPOST	0	13	30	0	18	25	0	100	95
16	Thiobencarb *fb* (propanil + molinate)	3.0 4.5	DPRE MPOST	0	37	34	0	38	30	94	80	67
17	Pendimethalin *fb* bispyribac-sodium + Kinetic	1.0 0.019 0.125%	DPRE POFL POFL	0	0	30	0	0	30	0	94	100
18	Pendimethalin *fb* molinate	1.0 3.0	DPRE POFL	0	18	35	0	18	35	0	30	33
19	Pendimethalin *fb* bispyribac-sodium + triclopyr + Kinetic	1.0 0.019 0.28 0.125%	DPRE POFL POFL POFL	0	0	96	0	0	96	0	100	100
20	Pendimethalin *fb* molinate + triclopyr	1.0 3.0 0.28	DPRE POFL POFL	0	0	100	0	0	100	0	90	95
21	Thiobencarb + propanil *fb* thiobencarb + bispyribac-sodium	2.0 3.0 2.0 0.019	EPOST EPOST PREFL PREFL	0	50	58	0	48	55	84	100	100
	LSD (0.05)			0	12	18	0	12	17	9	14	15

continued

Table 10. Section 4.

				Weed control						
				Hemp sesbania (SEBEX)			Bearded sprangletop (LEFFA)	Effect on rice Chlorosis		
	Herbicide	Rate	Application timing	6/15	7/18	8/17	8/17	6/1	6/9	6/15
		(lb ai/A)		---------- (%) ----------						
1	Untreated check			0	0	0	0	0	0	0
2	Bispyribac-sodium +	0.019	MPOST	13	100	100	100	0	0	0
	Kinetic	0.125%	MPOST							
	triclopyr	0.28	POFL							
3	(Propanil + molinate) *fb*	4.5	MPOST	81	95	95	100	0	0	0
	triclopyr	0.28	POFL							
4	Bispyribac-sodium +	0.019	MPOST	15	100	96	88	0	0	0
	Kinetic *fb*	0.125%	MPOST							
	bispyribac-sodium +	0.019	PREFL							
	Kinetic	0.125%	PREFL							
5	Propanil *fb*	3.0	EPOST	99	98	98	95	0	0	0
	(propanil + molinate)	4.0	PREFL							
6	Bispyribac-sodium +	0.019	MPOST	10	96	99	93	0	0	0
	Kinetic *fb*	0.125%	MPOST							
	bispyribac-sodium +	0.026	POFL							
	Kinetic	0.125%	POFL							
7	(Propanil + molinate) *fb*	4.5	MPOST	86	90	91	90	0	0	0
	molinate +	3.0	POFL							
	bensulfuron +	0.0375	POFL							
	Agri-Dex	1%	POFL							
8	Pendimethalin *fb*	1.0	DPRE	33	74	74	100	0	0	0
	bispyribac-sodium +	0.017	MPOST							
	Kinetic	0.125%	MPOST							
9	Pendimethalin *fb*	1.0	DPRE	38	70	71	100	0	0	0
	bispyribac-sodium +	0.019	MPOST							
	Kinetic	0.125%	MPOST							
10	Pendimethalin *fb*	1.0	DPRE	88	78	80	100	0	0	0
	(propanil + molinate)	4.5	MPOST							
11	Clomazone *fb*	0.3	PRE	0	96	94	100	18	45	5
	bispyribac-sodium +	0.019	PREFL							
	Kinetic	0.125%	PREFL							
12	Clomazone *fb*	0.3	PRE	0	59	84	100	25	46	6
	bispyribac-sodium +	0.019	POFL							
	Kinetic	0.125%	POFL							
13	Clomazone *fb*	0.3	PRE	0	98	98	100	18	45	7
	(propanil + molinate)	4.5	PREFL							
14	Clomazone *fb*	0.3	PRE	0	43	53	100	19	45	5
	molinate +	3.0	POFL							
	bensulfuron +	0.0375	POFL							
	Agri-Dex	1%	POFL							
15	Thiobencarb *fb*	3.0	DPRE	35	86	81	100	0	0	0
	bispyribac-sodium +	0.019	MPOST							
	Kinetic	0.125%	MPOST							
16	Thiobencarb *fb*	3.0	DPRE	91	86	86	100	0	0	0
	(propanil + molinate)	4.5	MPOST							
17	Pendimethalin *fb*	1.0	DPRE	0	73	95	100	0	0	0
	bispyribac-sodium +	0.019	POFL							
	Kinetic	0.125%	POFL							
18	Pendimethalin *fb*	1.0	DPRE	0	18	10	100	0	0	0
	molinate	3.0	POFL							

continued

Table 10. Section 4. Continued.

				Weed control								
				Hemp sesbania (SEBEX)			Bearded sprangletop (LEFFA)		Effect on rice Chlorosis		
	Herbicide	Rate	Application timing	6/15	7/18	8/17	8/17		6/1	6/9	6/15
		(lb ai/A)		(%)							
19	Pendimethalin *fb* bispyribac-sodium + triclopyr + Kinetic	1.0 0.019 0.28 0.125%	DPRE POFL POFL POFL	0	80	98	100		0	0	0
20	Pendimethalin *fb* molinate + triclopyr	1.0 3.0 0.28	DPRE POFL POFL	0	74	84	100		0	0	0
21	Thiobencarb + propanil *fb* thiobencarb + bispyribac-sodium	2.0 3.0 2.0 0.019	EPOST EPOST PREFL PREFL	99	100	100	100		0	0	0
	LSD (0.05)			8	14	12	9		8	4	1

continued

Table 10. Section 5.

				Effect on rice							
				Biomass reduction			Injury			Days to 50% Heading	Yield
	Herbicide	Rate	Application timing	6/15	7/18	6/1	6/15	7/18	6/15	7/18	8/17
		(lb ai/A)		(%)						(days)	(lb/A)
1	Untreated check			0	0	0	0	0	0	87	3539
2	Bispyribac-sodium + Kinetic triclopyr	0.019 0.125% 0.28	MPOST MPOST POFL	0	0	0	0	0	0	86	6889
3	(Propanil + molinate) *fb* triclopyr	4.5 0.28	MPOST POFL	0	0	0	0	0	0	86	6127
4	Bispyribac-sodium + Kinetic *fb* bispyribac-sodium + Kinetic	0.019 0.125% 0.019 0.125%	MPOST MPOST PREFL PREFL	0	0	0	0	0	0	86	8068
5	Propanil *fb* (propanil + molinate)	3.0 4.0	EPOST PREFL	0	0	0	0	0	0	86	7149
6	Bispyribac-sodium + Kinetic *fb* bispyribac-sodium + Kinetic	0.019 0.125% 0.026 0.125%	MPOST MPOST POFL POFL	0	0	0	0	0	10	87	7782
7	(Propanil + molinate) *fb* molinate + bensulfuron + Agri-Dex	4.5 3.0 0.0375 1%	MPOST POFL POFL POFL	0	0	0	0	0	16	87	7389
8	Pendimethalin *fb* bispyribac-sodium + Kinetic	1.0 0.017 0.125%	DPRE MPOST MPOST	3	0	1	0	0	3	88	7950
9	Pendimethalin *fb* bispyribac-sodium + Kinetic	1.0 0.019 0.125%	DPRE MPOST MPOST	3	0	1	1	0	0	86	8334
10	Pendimethalin *fb* (propanil + molinate)	1.0 4.5	DPRE MPOST	0	0	3	0	0	0	86	8643

continued

Table 10. Section 5. Continued.

				Effect on rice							
				Biomass reduction			Injury			Days to 50% Heading	Yield
	Herbicide	Rate	Application timing	6/15	7/18	6/1	6/15	7/18	6/15	7/18	8/17
		(lb ai/A)		---------- (%) ----------						(days)	(lb/A)
11	Clomazone *fb* bispyribac-sodium + Kinetic	0.3 0.019 0.125%	PRE PREFL PREFL	3	15	0	11	0	0	86	7879
12	Clomazone *fb* bispyribac-sodium + Kinetic	0.3 0.019 0.125%	PRE POFL POFL	1	6	1	5	0	15	86	8563
13	Clomazone *fb* (propanil + molinate)	0.3 4.5	PRE PREFL	1	1	0	3	0	3	87	8463
14	Clomazone *fb* molinate + bensulfuron + Agri-Dex	0.3 3.0 0.0375 1%	PRE POFL POFL POFL	0	0	0	1	0	16	88	7517
15	Thiobencarb *fb* bispyribac-sodium + Kinetic	3.0 0.019 0.125%	DPRE MPOST MPOST	0	0	5	0	0	0	88	7607
16	Thiobencarb *fb* (propanil + molinate)	3.0 4.5	DPRE MPOST	0	0	0	2	0	0	87	6864
17	Pendimethalin *fb* bispyribac-sodium + Kinetic	1.0 0.019 0.125%	DPRE POFL POFL	0	0	0	0	0	8	88	8582
18	Pendimethalin *fb* molinate	1.0 3.0	DPRE POFL	0	0	0	0	0	16	87	6795
19	Pendimethalin *fb* bispyribac-sodium + triclopyr + Kinetic	1.0 0.019 0.28 0.125%	DPRE POFL POFL POFL	0	0	0	0	0	0	87	8254
20	Pendimethalin *fb* molinate + triclopyr	1.0 3.0 0.28	DPRE POFL POFL	0	0	0	0	0	18	88	7457
21	Thiobencarb + propanil *fb* thiobencarb + bispyribac-sodium	2.0 3.0 2.0 0.019	EPOST EPOST PREFL PREFL	0	0	0	1	0	0	86	8502
	LSD (0.05)			3	8	4	6	0	11	3	1698

Table 11. Bispyribac-sodium and RH-149109 in a total postemergence program, Stuttgart, 2000.

SUMMARY

Bispyribac-sodium (Regiment) and RH-149109 were evaluated in a total postemergence program tank-mixed with the soil-applied herbicides quinclorac (Facet) at 0.25 lb ai/A, pendimethalin (Prowl) at 1.0 lb ai/A, or thiobencarb (Bolero) 3.0 lb ai/A. Bispyribac-sodium was applied at 0.0192 and 0.039 lb ai/A at the 3- to 4-leaf grass stage with soil-applied herbicides. A second application of bispyribac-sodium, applied alone, was made at the 5- to 6-leaf rice stage using the same rate used at the 3- to 4-leaf grass stage. RH-149109 was used at 0.035, 0.053, and 0.071 lb ai/A. A second application of RH-149109, applied alone, was made at the 5- to 6-leaf rice stage using the same rate used at the 3- to 4-leaf grass stage.

No differences were observed between bispyribac-sodium and RH-149109 for control of propanil-resistant and -susceptible barnyardgrass. Broadleaf signalgrass control ranged from 62 to 98% with all herbicide programs evaluated. Quinclorac was needed in a program for the control of pitted and tall morningglory. All programs controlled northern jointvetch and hemp sesbania.

Bispyribac-sodium at 0.0192 lb/A generally pruned rice roots 20% when compared visually to roots of the untreated check plants. RH-149109 applied at 0.053 lb/A pruned rice roots by 25% with a single application and 60% with a sequential application. Rice heading was delayed when the higher rates of both compounds were used in a sequential program; however, these same programs tended to give the highest yields in this experiment.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 5.2

Planting date ..... May 17, 2000
Harvest date ..... September 21, 2000
Crop / Variety ..... rice / Wells
Dates of flushing ..... June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: MPOST = midpostemergence; and PREFL = preflood.

Application type	MPOST	PREFL
Date applied	June 12, 2000	June 22, 2000
Time	7:00 pm	8:00 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	84 / 84	78 / 83
Relative humidity (%)	62	90
Wind (mph)	4	2
Cloud cover (%)	40	50
Soil moisture	dry	wet
Crop stage/Height	4 lf / 8"	5-6 lf / 11"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet DG / 11002
Boom ht / # Noz / Spacing (in.)	25 / 3 / 18	29 / 3 / 18
Gpa / Psi	15 / 38	15 / 25
Weed species (density)	---------- [# leaves/height (in.)] ----------	
S-ECHCG (15/ft in row)	3-4 lf / 2-3"	5 lf / 6-8"
R-ECHCG (20/ft in row)	4 lf / 4-5"	5-6 lf / 7-8"
N-ECHCG (8-10/ft^2)	4-5 lf / 5-6"	6 lf / 8-10"
BRAPP (25/ft in row)	4-5 lf / 3-3.5"	7-9 lf / 4-5"
IPOLA (20/ft in row)	5-6 lf / 4"	7-8 lf / 5-6"
PHBPU (15/ft in row)	3-4 lf / 2-3"	6-8 lf / 5-6"
AESVI (8/ft in row)	4-5 lf / 3-4"	6-7 lf / 5"
SEBEX (40/ft in row)	5 lf / 8-9"	6-8 lf / 10-12"
LEFFA (0.2/ft^2)	N/A	1 lf / 0.5"

Table 11. Section 1.

				Barnyardgrass control								
			Application	Natural (N-ECHCG)			Susceptible (S-ECHCG)			Resistant (R-ECHCG)		
	Herbicide	Rate	timing	6/15	7/11	/16	6/15	7/11	8/16	6/15	7/11	8/16
		(lb ai/A)		---------- (%) ----------								
1	Untreated check			0	0	0	0	0	0	0	0	0
2	Propanil +	4.0	MPOST	58	50	34	58	50	34	55	50	36
	quinclorac *fb*	0.25	MPOST									
	propanil	4.0	PREFL									
3	Propanil +	4.0	MPOST	41	43	30	41	43	25	28	43	23
	pendimethalin *fb*	1.0	MPOST									
	propanil	4.0	PREFL									
4	Propanil +	4.0	MPOST	48	89	89	48	95	89	48	95	89
	quinclorac *fb*	0.25	MPOST									
	RH-149109	0.053	PREFL									
5	Propanil +	4.0	MPOST	55	95	98	58	100	98	45	100	99
	pendimethalin *fb*	1.0	MPOST									
	RH-149109	0.053	PREFL									
6	RH-149109 +	0.053	MPOST	51	93	95	51	93	95	49	93	96
	quinclorac *fb*	0.25	MPOST									
	RH-149109	0.053	PREFL									
7	RH-149109 +	0.053	MPOST	43	56	43	43	60	43	53	60	40
	quinclorac *fb*	0.25	MPOST									
	propanil	4.0	PREFL									
8	RH-149109 +	0.053	MPOST	49	95	99	49	99	99	46	99	97
	quinclorac *fb*	0.25	MPOST									
	RH-149109	0.071	PREFL									
9	Bispyribac-sodium +	0.019	MPOST	44	74	90	44	90	90	34	90	90
	quinclorac +	0.25	MPOST									
	Kinetic *fb*	0.125%	MPOST									
	bispyribac-sodium +	0.019	PREFL									
	Kinetic	0.125%	PREFL									
10	Bispyribac-sodium +	0.039	MPOST	41	91	96	41	96	96	38	93	91
	quinclorac +	0.25	MPOST									
	Kinetic *fb*	0.125%	MPOST									
	bispyribac-sodium +	0.039	PREFL									
	Kinetic	0.125%	PREFL									
11	Bispyribac-sodium +	0.019	MPOST	41	85	90	41	90	90	33	90	90
	thiobencarb +	3.0	MPOST									
	Kinetic *fb*	0.125%	MPOST									
	bispyribac-sodium +	0.019	PREFL									
	Kinetic	0.125%	PREFL									
12	Bispyribac-sodium +	0.039	MPOST	53	95	98	53	99	98	45	96	97
	thiobencarb +	3.0	MPOST									
	Kinetic *fb*	0.125%	MPOST									
	bispyribac-sodium +	0.019	PREFL									
	Kinetic	0.125%	PREFL									
13	Bispyribac-sodium +	0.019	MPOST	34	75	92	34	95	92	35	95	96
	pendimethalin +	1.0	MPOST									
	Kinetic *fb*	0.125%	MPOST									
	bispyribac-sodium +	0.019	PREFL									
	Kinetic	0.125%	PREFL									
14	Bispyribac-sodium +	0.039	MPOST	38	98	99	38	98	99	33	98	99
	pendimethalin +	1.0	MPOST									
	Kinetic *fb*	0.125%	MPOST									
	bispyribac- sodium +	0.039	PREFL									
	Kinetic	0.125%	PREFL									

continued

Table 11. Section 1. Continued.

				Barnyardgrass control								
			Application	Natural (N-ECHCG)			Susceptible (S-ECHCG)			Resistant (R-ECHCG)		
	Herbicide	Rate	timing	6/15	7/11	/16	6/15	7/11	8/16	6/15	7/11	8/16
		(lb ai/A)		---------- (%) ----------								
15	RH-149109 +	0.035	MPOST	33	89	94	28	94	94	31	94	92
	pendimethalin *fb*	1.0	MPOST									
	RH-149109	0.035	PREFL									
16	RH-149109 +	0.053	MPOST	73	89	96	66	98	96	36	98	96
	pendimethalin *fb*	1.0	MPOST									
	RH-149109	0.053	PREFL									
17	RH-149109 +	0.071	MPOST	35	90	90	35	98	90	35	96	99
	pendimethalin *fb*	1.0	MPOST									
	RH-149109	0.071	PREFL									
18	RH-149109 +	0.035	MPOST	33	93	91	33	100	91	33	98	93
	thiobencarb *fb*	3.0	MPOST									
	RH-149109	0.035	PREFL									
19	RH-149109 +	0.053	MPOST	35	93	97	35	98	97	43	98	98
	thiobencarb *fb*	3.0	MPOST									
	RH-149109	0.053	PREFL									
20	RH-149109 +	0.071	MPOST	43	98	100	43	98	100	43	98	100
	thiobencarb *fb*	3.0	MPOST									
	RH-149109	0.071	PREFL									
	LSD (0.05)			19	10	13	19	10	13	17	10	12

continued

Table 11. Section 2.

				Weed control								
			Application	Broadleaf signalgrass (BRAPP)			Tall morningglory (PHBPU)			Pitted morningglory (IPOLA)		
	Herbicide	Rate	timing	6/15	7/11	/16	6/15	7/11	8/16	6/15	7/11	8/16
		(lb ai/A)		---------- (%) ----------								
1	Untreated check			0	0	0	0	0	0	0	0	0
2	Propanil +	4.0	MPOST	59	99	91	89	100	100	66	100	100
	quinclorac *fb*	0.25	MPOST									
	propanil	4.0	PREFL									
3	Propanil +	4.0	MPOST	44	93	90	86	100	100	49	100	100
	pendimethalin *fb*	1.0	MPOST									
	propanil	4.0	PREFL									
4	Propanil +	4.0	MPOST	61	100	98	83	100	100	48	100	100
	quinclorac *fb*	0.25	MPOST									
	RH-149109	0.053	PREFL									
5	Propanil +	4.0	MPOST	36	100	99	54	79	83	13	79	83
	pendimethalin *fb*	1.0	MPOST									
	RH-149109	0.053	PREFL									
6	RH-149109 +	0.053	MPOST	23	83	79	70	100	100	14	100	100
	quinclorac *fb*	0.25	MPOST									
	RH-149109	0.053	PREFL									
7	RH-149109 +	0.053	MPOST	34	99	84	45	100	100	13	100	100
	quinclorac *fb*	0.25	MPOST									
	propanil	4.0	PREFL									

continued

Table 11. Section 2. Continued.

				Weed control								
				Broadleaf signalgrass (BRAPP)			Tall morningglory (PHBPU)			Pitted morningglory (IPOLA)		
	Herbicide	Rate	Application timing	6/15	7/11	/16	6/15	7/11	8/16	6/15	7/11	8/16
		(lb ai/A)		---------- (%) ----------								
8	RH-149109 +	0.053	MPOST	21	96	90	79	100	100	20	100	100
	quinclorac *fb*	0.25	MPOST									
	RH-149109	0.071	PREFL									
9	Bispyribac-sodium +	0.019	MPOST	18	79	62	64	100	100	20	100	100
	quinclorac +	0.25	MPOST									
	Kinetic *fb*	0.125%	MPOST									
	bispyribac-sodium +	0.019	PREFL									
	Kinetic	0.125%	PREFL									
10	Bispyribac-sodium +	0.039	MPOST	33	80	71	75	100	100	15	100	100
	quinclorac +	0.25	MPOST									
	Kinetic *fb*	0.125%	MPOST									
	bispyribac-sodium +	0.039	PREFL									
	Kinetic	0.125%	PREFL									
11	Bispyribac-sodium +	0.019	MPOST	23	68	69	15	43	10	3	28	10
	thiobencarb +	3.0	MPOST									
	Kinetic *fb*	0.125%	MPOST									
	bispyribac-sodium +	0.019	PREFL									
	Kinetic	0.125%	PREFL									
12	Bispyribac-sodium +	0.039	MPOST	15	93	82	20	100	85	3	89	85
	thiobencarb +	3.0	MPOST									
	Kinetic *fb*	0.125%	MPOST									
	bispyribac-sodium +	0.039	PREFL									
	Kinetic	0.125%	PREFL									
13	Bispyribac-sodium +	0.019	MPOST	10	78	63	11	23	15	0	23	18
	pendimethalin +	1.0	MPOST									
	Kinetic *fb*	0.125%	MPOST									
	bispyribac-sodium +	0.019	PREFL									
	Kinetic	0.125%	PREFL									
14	Bispyribac-sodium +	0.039	MPOST	16	83	84	20	91	100	0	91	100
	pendimethalin +	1.0	MPOST									
	Kinetic *fb*	0.125%	MPOST									
	bispyribac- sodium +	0.039	PREFL									
	Kinetic	0.125%	PREFL									
15	RH-149109 +	0.035	MPOST	14	75	80	0	43	24	0	35	24
	pendimethalin *fb*	1.0	MPOST									
	RH-149109	0.035	PREFL									
16	RH-149109 +	0.053	MPOST	8	56	65	8	55	23	0	60	23
	pendimethalin *fb*	1.0	MPOST									
	RH-149109	0.053	PREFL									
17	RH-149109 +	0.071	MPOST	11	80	87	4	80	63	0	78	65
	pendimethalin *fb*	1.0	MPOST									
	RH-149109	0.071	PREFL									
18	RH-149109 +	0.035	MPOST	23	81	65	4	50	10	1	33	10
	thiobencarb *fb*	3.0	MPOST									
	RH-149109	0.035	PREFL									
19	RH-149109 +	0.053	MPOST	28	90	92	16	50	53	1	50	53
	thiobencarb *fb*	3.0	MPOST									
	RH-149109	0.053	PREFL									
20	RH-149109 +	0.071	MPOST	14	94	92	1	65	58	0	55	58
	thiobencarb *fb*	3.0	MPOST									
	RH-149109	0.071	PREFL									
	LSD (0.05)			20	25	30	21	31	29	13	29	29

continued

Table 11. Section 3.

				Weed control							
				Northern jointvetch (AESVI)			Hemp sesbania (SEBEX)			Bearded sprangletop (LEFFA)	
	Herbicide	Rate	Application timing	6/21	7/11	8/17	6/21	7/11	8/17	7/18	8/17
		(lb ai/A)		(%)							
1	Untreated check			0	0	0	0	0	0	0	0
2	Propanil +	4.0	MPOST	100	100	100	100	100	100	58	88
	quinclorac *fb*	0.25	MPOST								
	propanil	4.0	PREFL								
3	Propanil +	4.0	MPOST	100	100	100	98	100	100	93	90
	pendimethalin *fb*	1.0	MPOST								
	propanil	4.0	PREFL								
4	Propanil +	4.0	MPOST	100	100	100	100	100	100	60	69
	quinclorac *fb*	0.25	MPOST								
	RH-149109	0.053	PREFL								
5	Propanil +	4.0	MPOST	95	100	100	96	100	100	76	78
	pendimethalin *fb*	1.0	MPOST								
	RH-149109	0.053	PREFL								
6	RH-149109 +	0.053	MPOST	100	100	100	95	100	100	55	60
	quinclorac *fb*	0.25	MPOST								
	RH-149109	0.053	PREFL								
7	RH-149109 +	0.053	MPOST	98	100	100	91	100	100	48	74
	quinclorac *fb*	0.25	MPOST								
	propanil	4.0	PREFL								
8	RH-149109 +	0.053	MPOST	99	100	100	98	100	100	70	76
	quinclorac *fb*	0.25	MPOST								
	RH-149109	0.071	PREFL								
9	Bispyribac-sodium +	0.019	MPOST	96	100	100	89	100	100	53	60
	quinclorac +	0.25	MPOST								
	Kinetic *fb*	0.125%	MPOST								
	bispyribac-sodium +	0.019	PREFL								
	Kinetic	0.125%	PREFL								
10	Bispyribac-sodium +	0.039	MPOST	95	100	100	85	100	100	75	80
	quinclorac +	0.25	MPOST								
	Kinetic *fb*	0.125%	MPOST								
	bispyribac-sodium +	0.039	PREFL								
	Kinetic	0.125%	PREFL								
11	Bispyribac-sodium +	0.019	MPOST	91	100	100	63	100	100	73	84
	thiobencarb +	3.0	MPOST								
	Kinetic *fb*	0.125%	MPOST								
	bispyribac-sodium +	0.019	PREFL								
	Kinetic	0.125%	PREFL								
12	Bispyribac-sodium +	0.039	MPOST	91	100	100	59	100	100	78	76
	thiobencarb +	3.0	MPOST								
	Kinetic *fb*	0.125%	MPOST								
	bispyribac-sodium +	0.019	PREFL								
	Kinetic	0.125%	PREFL								
13	Bispyribac-sodium +	0.019	MPOST	84	100	100	44	100	100	63	73
	pendimethalin +	1.0	MPOST								
	Kinetic *fb*	0.125%	MPOST								
	bispyribac-sodium +	0.019	PREFL								
	Kinetic	0.125%	PREFL								
14	Bispyribac-sodium +	0.039	MPOST	99	100	100	51	100	100	66	71
	pendimethalin +	1.0	MPOST								
	Kinetic *fb*	0.125%	MPOST								
	bispyribac- sodium +	0.039	PREFL								
	Kinetic	0.125%	PREFL								

continued

Table 11. Section 3. Continued.

				Weed control							
				Northern jointvetch (AESVI)			Hemp sesbania (SEBEX)			Bearded sprangletop (LEFFA)	
	Herbicide	Rate	Application timing	6/21	7/11	8/17	6/21	7/11	8/17	7/18	8/17
		(lb ai/A)		---------- (%) ----------							
15	RH-149109 +	0.035	MPOST	95	100	100	49	100	100	64	68
	pendimethalin *fb*	1.0	MPOST								
	RH-149109	0.035	PREFL								
16	RH-149109 +	0.053	MPOST	91	100	100	50	100	100	66	71
	pendimethalin *fb*	1.0	MPOST								
	RH-149109	0.053	PREFL								
17	RH-149109 +	0.071	MPOST	96	100	100	48	100	100	62	84
	pendimethalin *fb*	1.0	MPOST								
	RH-149109	0.071	PREFL								
18	RH-149109 +	0.035	MPOST	94	100	100	43	100	100	75	65
	thiobencarb *fb*	3.0	MPOST								
	RH-149109	0.035	PREFL								
19	RH-149109 +	0.053	MPOST	96	100	100	60	100	100	76	84
	thiobencarb *fb*	3.0	MPOST								
	RH-149109	0.053	PREFL								
20	RH-149109 +	0.071	MPOST	98	100	100	45	100	100	77	84
	thiobencarb *fb*	3.0	MPOST								
	RH-149109	0.071	PREFL								
	LSD (0.05)			10	0	0	14	0	0	25	17

continued

Table 11. Section 4.

				Effect on rice					
				Injury			Root pruning	Days to 50%	Yield
	Herbicide	Rate	Application timing	6/29	7/11	7/18	7/11	heading	9/21
		(lb ai/A)		---------- (%) ----------				(DAE)	(lb/A)
1	Untreated check			0	0	0	0	89	697
2	Propanil +	4.0	MPOST	0	0	0	0	88	3847
	quinclorac *fb*	0.25	MPOST						
	propanil	4.0	PREFL						
3	Propanil +	4.0	MPOST	0	0	0	0	88	2027
	pendimethalin *fb*	1.0	MPOST						
	propanil	4.0	PREFL						
4	Propanil +	4.0	MPOST	0	5	0	24	87	7331
	quinclorac *fb*	0.25	MPOST						
	RH-149109	0.053	PREFL						
5	Propanil +	4.0	MPOST	0	3	0	31	88	7109
	pendimethalin *fb*	1.0	MPOST						
	RH-149109	0.053	PREFL						
6	RH-149109 +	0.053	MPOST	0	4	0	41	87	6159
	quinclorac *fb*	0.25	MPOST						
	RH-149109	0.053	PREFL						
7	RH-149109 +	0.053	MPOST	0	3	0	25	87	5438
	quinclorac *fb*	0.25	MPOST						
	propanil	4.0	PREFL						

continued

Table 11. Section 4. Continued.

				Effect on rice					
				Injury			Root pruning	Days to 50%	Yield
	Herbicide	Rate	Application timing	6/29	7/11	7/18	7/11	heading	9/21
		(lb ai/A)		---------- (%) ----------				(DAE)	(lb/A)
8	RH-149109 +	0.053	MPOST	0	11	0	59	87	6016
	quinclorac *fb*	0.25	MPOST						
	RH-149109	0.071	PREFL						
9	Bispyribac-sodium +	0.019	MPOST	0	6	0	25	87	7006
	quinclorac +	0.25	MPOST						
	Kinetic *fb*	0.125%	MPOST						
	bispyribac-sodium +	0.019	PREFL						
	Kinetic	0.125%	PREFL						
10	Bispyribac-sodium +	0.039	MPOST	0	10	0	48	87	6571
	quinclorac +	0.25	MPOST						
	Kinetic *fb*	0.125%	MPOST						
	bispyribac-sodium +	0.039	PREFL						
	Kinetic	0.125%	PREFL						
11	Bispyribac-sodium +	0.019	MPOST	0	0	0	20	87	6475
	thiobencarb +	3.0	MPOST						
	Kinetic *fb*	0.125%	MPOST						
	bispyribac-sodium +	0.019	PREFL						
	Kinetic	0.125%	PREFL						
12	Bispyribac-sodium +	0.039	MPOST	0	11	0	41	85	7196
	thiobencarb +	3.0	MPOST						
	Kinetic *fb*	0.125%	MPOST						
	bispyribac-sodium +	0.039	PREFL						
	Kinetic	0.125%	PREFL						
13	Bispyribac-sodium +	0.019	MPOST	0	4	0	19	85	6697
	pendimethalin +	1.0	MPOST						
	Kinetic *fb*	0.125%	MPOST						
	bispyribac-sodium +	0.019	PREFL						
	Kinetic	0.125%	PREFL						
14	Bispyribac-sodium +	0.039	MPOST	0	10	0	49	87	7040
	pendimethalin +	1.0	MPOST						
	Kinetic *fb*	0.125%	MPOST						
	bispyribac- sodium +	0.039	PREFL						
	Kinetic	0.125%	PREFL						
15	RH-149109 +	0.035	MPOST	0	11	0	46	86	6960
	pendimethalin *fb*	1.0	MPOST						
	RH-149109	0.035	PREFL						
16	RH-149109 +	0.053	MPOST	0	14	0	64	85	6556
	pendimethalin *fb*	1.0	MPOST						
	RH-149109	0.053	PREFL						
17	RH-149109 +	0.071	MPOST	0	13	0	70	85	6496
	pendimethalin *fb*	1.0	MPOST						
	RH-149109	0.071	PREFL						
18	RH-149109 +	0.035	MPOST	0	5	0	28	87	7181
	thiobencarb *fb*	3.0	MPOST						
	RH-149109	0.035	PREFL						
19	RH-149109 +	0.053	MPOST	0	6	0	60	86	7437
	thiobencarb *fb*	3.0	MPOST						
	RH-149109	0.053	PREFL						
20	RH-149109 +	0.071	MPOST	0	13	0	70	84	6865
	thiobencarb *fb*	3.0	MPOST						
	RH-149109	0.071	PREFL						
	LSD (0.05)			0	10	0	18	2	1306

Table 12. Bispyribac-sodium programs with carfentrazone-ethyl and fenoxaprop + isoxadifen, Stuttgart, 2000.

SUMMARY

Bispyribac-sodium (Regiment) was evaluated at 0.0192 lb ai/A at the 4- to 5- leaf rice stage and postflood application timings. Herbicide programs included propanil (Stam M-4) at 3.0 lb ai/A applied to 2- to 3-leaf rice followed by bispyribac-sodium, carfentrazone-ethyl (Aim), or bispyribac-sodium + carfentrazone-ethyl at the postflood timing. Bispyribac-sodium was also evaluated in a tank mixture with fenoxaprop + safener (Ricestar) on 4- to 5-leaf rice.

No rice injury was observed with any bispyribac-sodium treatments. Control of propanil-resistant and -susceptible barnyardgrass at the end of the season was >80% with all bispyribac-sodium treatments. Control of pitted and tall morningglory was obtained only with programs containing quinclorac or carfentrazone-ethyl. All programs, except fenoxaprop + safener applied alone, controlled >83% of northern jointvetch and > 95% of hemp sesbania.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 7.3

Planting date ..... May 18, 2000
Harvest date ..... September 14, 2000
Crop / Variety ..... rice / Wells
Dates of flushing ..... May 25 and 30, June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: EPOST = early postemergence; MPOST = midpostemergence; PREFL = preflood; and POFL = postflood.

Application type	EPOST	MPOST	PREFL	POFL
Date applied	June 2, 2000	June 12, 2000	June 19, 2000	July 5, 2000
Time	2:30 pm	7:00 pm	10:00 am	2:00 pm
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	95 / 92	84 / 84	93 / 84	95 / 88
Relative humidity (%)	45	62	85	89
Wind (mph)	2	3	1	2
Cloud cover (%)	15	40	50	30
Soil moisture	adequate	adequate	adequate	flooded
Crop stage/Height	2 lf / 5"	4 lf / 8"	5-1 lf / 11"	7-8 lf / 18"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 11001
Boom ht / # Noz / Spacing (in.)	16 / 3 / 18	16 / 3 / 18	16 / 3 / 18	16 / 3 / 18
Gpa / Psi	10 / 24	10 / 22	10 / 25	10 / 30
Weed species (density)	[# leaves/height (in.)]			
R-ECHCG (20/ft in row)	1-2 lf / 1-2"	4-5 lf / 4-5"	5 lf / 8-9"	7-8 lf / 13-15"
S-ECHCG (20/ft in row)	1 lf / 1-2"	4 lf / 3-4"	5-6 lf / 7-9"	6-7 lf / 13-14"
BRAPP (14/ft in row)	1-2 lf / 2"	3-4 lf / 3-4"	6-7 lf / 4-6"	8-11 lf / 8-9"
IPOLA (10/ft in row)	2 lf / 2"	5-6 lf / 5-6"	6-7 lf / 6-8"	15+ lf / 9-11"
PHBPU (10/ft in row)	2 lf / 2"	4-5 lf / 5"	6-7 lf / 6-7"	10-12 lf / 9-11"
AESVI (3/ft in row)	1-2 lf / 2-3"	3-4 lf / 2-3"	5 lf / 6-7"	10-12 lf / 9-11"
SEBEX (30/ft in row))	2-3 lf / 3-4"	6 lf / 8-10"	8-10 lf / 10"	11-13 lf / 15-18"

Table 12. Section 1.

				Weed control								
				Barnyardgrass						Broadleaf signalgrass		
			Application	Susc. (S-ECHCG)			Resistant (R-ECHCG)			(BRAPP)		
	Herbicide	Rate	timing	6/15	7/16	8/17	6/15	7/16	8/17	6/15	7/16	8/17
		(lb ai/A)		---------- (%) ----------								
1	Untreated check			0	0	0	0	0	0	0	0	0
2	Propanil *fb* bispyribac-sodium + Kinetic	3.0 0.019 0.125%	EPOST POFL POFL	50	88	91	0	58	88	30	23	18
3	Propanil *fb* bispyribac-sodium + carfentrazone + Kinetic	3.0 0.019 0.02 0.125%	EPOST POFL POFL POFL	56	75	90	0	55	85	45	46	48
4	Propanil *fb* bispyribac-sodium + carfentrazone + Kinetic	3.0 0.019 0.03 0.125%	EPOST POFL POFL POFL	68	65	90	0	59	94	50	35	8
5	Propanil *fb* carfentrazone + Kinetic	3.0 0.02 0.125%	EPOST POFL POFL	15	18	18	0	10	20	15	23	28
6	Propanil *fb* carfentrazone + Kinetic	3.0 0.03 0.125%	EPOST POFL POFL	63	10	18	0	13	20	35	28	20
7	Bispyribac-sodium + Kinetic	0.019 0.125%	MPOST MPOST	0	83	84	0	79	80	0	33	28
8	Bispyribac-sodium + (fenoxaprop + safener) + Kinetic	0.019 0.067 0.125%	MPOST MPOST MPOST	0	75	80	0	60	58	0	63	80
9	Bispyribac-sodium + (fenoxaprop + safener) + Kinetic	0.019 0.033 0.125%	MPOST MPOST MPOST	0	78	90	0	69	80	0	56	88
10	(Fenoxaprop + safener) + Agri-Dex	0.067 1%	MPOST MPOST	0	96	91	0	97	94	0	98	100
11	(Fenoxaprop + safener) + Agri-Dex	0.033 1%	MPOST MPOST	0	35	66	0	32	48	0	94	95
12	Propanil + quinclorac *fb* propanil + triclopyr	3.0 0.25 3.0 0.25	EPOST EPOST PREFL PREFL	100	100	96	91	98	90	96	100	100
13	Propanil + pendimethalin *fb* quinclorac + propanil	3.0 1.0 0.375 3.0	EPOST EPOST PREFL PREFL	66	100	99	45	99	100	65	100	100
	LSD (0.05)			15	16	9	6	15	16	16	20	16

continued

Table 12. Section 2.

				Weed control								
				Tall morningglory (PHBPU)		Pitted morningglory (IPOLA)			Northern jointvetch (AESVI)		
	Herbicide	Rate	Application timing	6/15	7/16	6/15	7/16	8/17	6/15	7/16	8/17
		(lb ai/A)		---------- (%) ----------							
1	Untreated Check			0	0	0	0	0	0	0	0
2	Propanil *fb* bispyribac-sodium + Kinetic	3.0 0.019 0.125%	EPOST POFL POFL	0	18	0	18	8	89	89	100
3	Propanil *fb* bispyribac-sodium + carfentrazone + Kinetic	3.0 0.019 0.02 0.125%	EPOST POFL POFL POFL	0	69	0	66	100	95	94	100
4	Propanil *fb* bispyribac-sodium + carfentrazone + Kinetic	3.0 0.019 0.03 0.125%	EPOST POFL POFL POFL	0	75	0	74	100	96	91	100
5	Propanil *fb* carfentrazone + Kinetic	3.0 0.02 0.125%	EPOST POFL POFL	0	65	0	63	93	91	77	84
6	Propanil *fb* carfentrazone + Kinetic	3.0 0.03 0.125%	EPOST POFL POFL	0	61	0	55	88	81	86	96
7	Bispyribac-sodium + Kinetic	0.019 0.125%	MPOST MPOST	0	13	0	13	10	95	81	95
8	Bispyribac-sodium + (fenoxaprop + safener) + Kinetic	0.019 0.067 0.125%	MPOST MPOST MPOST	0	13	0	13	10	96	88	95
9	Bispyribac-sodium + (fenoxaprop + safener) + Kinetic	0.019 0.033 0.125%	MPOST MPOST MPOST	0	18	0	18	10	95	91	100
10	(Fenoxaprop + safener) + Agri-Dex	0.067 1%	MPOST MPOST	0	13	0	13	10	0	0	0
11	(Fenoxaprop + safener) + Agri-Dex	0.033 1%	MPOST MPOST	0	11	0	11	10	1	0	0
12	Propanil + quinclorac *fb* propanil + triclopyr	3.0 0.25 3.0 0.25	EPOST EPOST PREFL PREFL	91	100	85	100	100	100	100	100
13	Propanil + pendimethalin *fb* quinclorac + propanil	3.0 1.0 0.375 3.0	EPOST EPOST PREFL PREFL	45	100	33	100	100	100	100	100
	LSD (0.05)			8	13	7	16	10	11	12	11

continued

Table 12. Section 3.

				Weed control							
				Hemp sesbania			Effect on rice				
			Application	(SEBEX)			Injury				Yield
	Herbicide	Rate	timing	6/15	7/16	8/17	6/8	6/15	6/26	7/11	9/14
		(lb ai/A)		----------	----------	----------	(%)	----------	----------	----------	(lb/A)
1	Untreated Check			0	0	0	0	0	0	0	2142
2	Propanil *fb*	3.0	EPOST	100	94	100	0	0	0	0	4327
	bispyribac-sodium +	0.019	POFL								
	Kinetic	0.125%	POFL								
3	Propanil *fb*	3.0	EPOST	100	98	100	0	0	0	0	4588
	bispyribac-sodium +	0.019	POFL								
	carfentrazone +	0.02	POFL								
	Kinetic	0.125%	POFL								
4	Propanil *fb*	3.0	EPOST	99	98	100	0	0	0	0	5362
	bispyribac-sodium +	0.019	POFL								
	carfentrazone +	0.03	POFL								
	Kinetic	0.125%	POFL								
5	Propanil *fb*	3.0	EPOST	99	94	95	0	0	0	0	4971
	carfentrazone +	0.02	POFL								
	Kinetic	0.125%	POFL								
6	Propanil *fb*	3.0	EPOST	100	94	98	0	0	0	0	6367
	carfentrazone +	0.03	POFL								
	Kinetic	0.125%	POFL								
7	Bispyribac-sodium +	0.019	MPOST	0	97	100	0	0	0	0	4258
	Kinetic	0.125%	MPOST								
8	Bispyribac-sodium +	0.019	MPOST	0	99	100	0	0	0	0	5445
	(fenoxaprop + safener)	0.067	MPOST								
	+ Kinetic	0.125%	MPOST								
9	Bispyribac-sodium +	0.019	MPOST	0	98	100	0	0	0	0	5791
	(fenoxaprop + safener)	0.033	MPOST								
	+ Kinetic	0.125%	MPOST								
10	(Fenoxaprop + safener) +	0.067	MPOST	0	0	0	0	0	0	0	3521
	Agri-Dex	1%	MPOST								
11	(Fenoxaprop + safener) +	0.033	MPOST	0	0	0	0	0	0	0	3646
	Agri-Dex	1%	MPOST								
12	Propanil +	3.0	EPOST	100	100	100	0	0	0	0	7451
	quinclorac *fb*	0.25	EPOST								
	propanil +	3.0	PREFL								
	triclopyr	0.25	PREFL								
13	Propanil +	3.0	EPOST	100	100	100	0	0	0	0	7333
	pendimethalin *fb*	1.0	EPOST								
	quinclorac +	0.375	PREFL								
	propanil	3.0	PREFL								
	LSD (0.05)			1	5	3	0	0	0	0	2825

Table 13. Potential use of allelopathic rice cultivars with reduced rates of herbicides, Stuttgart, 2000.

SUMMARY

This experiment evaluated the potential use of allelopathic rice accessions in combination with reduced rates of rice herbicides for season-long weed control of barnyardgrass. PI 312777, Tequing, Rexmont, Lemont, and Drew cultivars were compared without herbicides and in combination with thiobencarb (Bolero) applied at a delayed preemergence timing at the reduced rates of 1 and 2 lb ai/A. Propanil (Stam M-4) at 2.0 lb ai/A was also evaluated at the 2- to 3-leaf rice stage.

PI 312777 and Tequing cultivars gave excellent control (>96%) of barnyardgrass without the use of herbicides. The addition of thiobencarb or propanil was not needed with these accessions. Rexmont and Lemont cultivars provided little control of barnyardgrass (<33%), and thiobencarb was needed to control this weed species. Drew showed some potential allelopathic effects; however, without herbicides barnyardgrass control was unacceptable (<72%), and a reduced rate of thiobencarb was needed.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 10 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 7.3

Planting date ..... May 25, 2000
Harvest date ..... September 14, 2000
Crop / Variety ..... rice / many
Dates of flushing ..... May 25 and 30, June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: DPRE = delayed preemergence; and EPOST = early postemergence.

Application type	DPRE	EPOST
Date applied	May 30, 2000	June 28, 2000
Time	7:00 am	8:00 am
Incorporation equipment	N/A	N/A
Air/Soil temperature (F)	74 / 78	72 / 75
Relative humidity (%)	65	90
Wind (mph)	3	2
Cloud cover (%)	0	100
Soil moisture	wet	dry
Crop stage/Height	N/A	2 lf / 5.5"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet DG / 110015
Boom ht / # Noz / Spacing (in.)	16 / 3 / 18	22 / 3 / 18
Gpa / Psi	10 / 32	10 / 28
Weed species (density)	---------- [# leaves/height (in.)] ----------	
ECHCG (5-6/ft^2)	N/A	2-3 lf / 3-4"

Table 13.

	Herbicide	Rate	Application timing	Barnyardgrass (ECHCG) control 6/25	7/11	8/17	9/16	Rice yield 10/15
		(lb ai/A)		---------- (%) ----------				(lb/A)
PI 312777:								
1	Untreated check			87	76	86	97	5577
2	Thiobencarb	1.0	DPRE	100	97	99	100	5636
3	Thiobencarb	2.0	DPRE	100	98	100	100	6603
4	Propanil	2.0	EPOST	94	94	93	98	6128
Tequing:								
5	Untreated check			96	95	92	99	8094
6	Thiobencarb	1.0	DPRE	97	97	97	100	7625
7	Thiobencarb	2.0	DPRE	100	99	100	100	6892
8	Propanil	2.0	EPOST	96	91	92	98	6775
Lemont:								
9	Untreated check			19	49	31	34	2403
10	Thiobencarb	1.0	DPRE	68	49	63	58	3540
11	Thiobencarb	2.0	DPRE	95	70	89	94	5148
12	Propanil	2.0	EPOST	68	58	66	66	3133
Rexmont:								
13	Untreated check			5	28	18	6	896
14	Thiobencarb	1.0	DPRE	70	55	43	51	3614
15	Thiobencarb	2.0	DPRE	73	45	43	39	2722
16	Propanil	2.0	EPOST	15	30	20	8	1368
Drew:								
17	Untreated check			66	60	59	73	5030
18	Thiobencarb	1.0	DPRE	99	90	97	97	6203
19	Thiobencarb	2.0	DPRE	99	89	94	99	6770
20	Propanil	2.0	EPOST	73	63	68	66	4896
	LSD (0.05)			27	32	22	24	1603

Table 14. Cultivar sensitivity to clomazone, Stuttgart, 2000.

SUMMARY

Rice cultivar sensitivity to some recommended rice herbicides has been shown in prior research. Clomazone (Command), is a new herbicide for rice, with the potential to be injurious early in the season. Twenty prominently grown rice cultivars were evaluated for their tolerance to clomazone applied preemergence at 0.3 and 0.6 lb ai/A (1 and 2 times the projected use-rate for this soil type).

Early-season chlorosis was more prevalent in all cultivars at 0.6 lb/A of clomazone than at 0.3 lb/A. Chlorosis of the rice cultivars RU9601096, Koshihikari, RU9801148, Wells, Kaybonnet, and Bengal ranged from 40 to 65% with 0.6 lb/A. Visual growth reduction and overall rice injury followed the same trend as chlorosis, with these same cultivars showing the highest amount of growth reduction from clomazone applied at 0.6 lb/A. Even though these cultivars had higher ratings for chlorosis, growth reduction, and overall rice injury, no significant yield differences were detected from treatments within a cultivar or among cultivars. From this research, there appeared to be early-season differences in overall tolerance to clomazone; however, this was not reflected by late-season observations or rice yield.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft by 16 ft
Row width / Number of rows per plot ..... 6.5 in. / 9 rows
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 5.2

Planting date ..... May 24, 1999
Harvest date ..... N/A
Crop / Variety ..... Rice / Many
Dates of flushing ..... May 30, June 9 and 13, 2000
Date of flooding ..... June 27, 2000

Comments: PRE = preemergence.

Application type	PRE
Date applied	May 25, 2000
Time	12:00 pm
Incorporation equipment	N/A
Air/Soil temperature (F)	85 / 76
Relative humidity (%)	76
Wind (mph)	4
Weather	partly cloudy
Soil moisture	dry
Crop stage/Height	N/A
Sprayer type/mph	BkPkCO_2 / 3
Nozzle type/Size	Teejet / 110015
Boom ht / # Noz / Spacing (in.)	16 / 3 / 18
Gpa / Psi	10 / 30

Table 14.

			Effect on rice									
		Application	Chlorosis			Biomass reduction			Injury			
Herbicide	Rate	timing	6/8	6/16	6/22	6/8	6/16	6/22	6/8	6/16	6/22	Yield
	(lb/A)		(%)									(lb/A)
Drew												
Untreated check			0	0	0	0	0	0	0	0	0	6560
Clomazone	0.3	PRE	15	4	4	1	2	0	2	2	0	8130
Clomazone	0.6	PRE	59	35	12	5	30	24	12	35	28	7670
Lemont												
Untreated check			0	0	0	0	0	0	0	0	0	7190
Clomazone	0.3	PRE	9	4	4	0	2	1	1	2	1	5910
Clomazone	0.6	PRE	58	29	10	6	26	21	11	31	25	6700
Priscilla												
Untreated check			0	0	0	0	0	0	0	0	0	7060
Clomazone	0.3	PRE	14	4	7	1	2	11	4	2	12	8540
Clomazone	0.6	PRE	58	30	8	8	25	15	14	31	16	7570
RU9701041												
Untreated check			0	0	0	0	0	0	0	0	0	7780
Clomazone	0.3	PRE	4	2	0	0	0	0	0	0	0	7030
Clomazone	0.6	PRE	55	12	6	5	11	11	10	14	11	6900
Madison												
Untreated check			0	0	0	0	0	0	0	0	0	5470
Clomazone	0.3	PRE	24	3	0	5	1	0	10	1	0	12780
Clomazone	0.6	PRE	51	38	15	6	29	22	12	34	26	6620
Cypress												
Untreated check			0	0	0	0	0	0	0	0	0	7390
Clomazone	0.3	PRE	15	4	2	4	2	0	5	2	0	7060
Clomazone	0.6	PRE	62	28	8	15	29	18	26	35	19	5820
Bengal												
Untreated check			0	0	0	0	0	0	0	0	0	6860
Clomazone	0.3	PRE	22	5	4	6	6	1	12	6	1	7640
Clomazone	0.6	PRE	70	45	18	20	42	29	32	51	35	6740
RU9801148												
Untreated check			0	0	0	0	0	0	0	0	0	7480
Clomazone	0.3	PRE	16	6	2	5	5	1	9	6	1	6230
Clomazone	0.6	PRE	68	40	20	25	44	35	36	51	40	7420
Kaybonnet												
Untreated check			0	0	0	0	0	0	0	0	0	7720
Clomazone	0.3	PRE	12	4	2	2	5	0	4	5	0	7950
Clomazone	0.6	PRE	61	51	14	12	38	26	21	44	31	7450
LaGrue												
Untreated check			0	0	0	0	0	0	0	0	0	8730
Clomazone	0.3	PRE	9	4	1	0	0	0	1	0	0	9180
Clomazone	0.6	PRE	52	30	14	6	24	19	11	29	21	9260
Wells												
Untreated check			0	0	0	0	0	0	0	0	0	6600
Clomazone	0.3	PRE	18	6	2	1	2	0	4	2	0	7630
Clomazone	0.6	PRE	68	44	20	12	68	26	22	44	31	8080
Mars												
Untreated check			0	0	0	0	0	0	0	0	0	9020
Clomazone	0.3	PRE	8	4	0	1	1	0	2	2	0	7660
Clomazone	0.6	PRE	56	30	18	12	30	29	19	35	26	7970

continued

Table 14. Continued.

Herbicide	Rate	Application timing	Effect on rice: Chlorosis 6/8	Chlorosis 6/16	Chlorosis 6/22	Biomass reduction 6/8	Biomass reduction 6/16	Biomass reduction 6/22	Injury 6/8	Injury 6/16	Injury 6/22	Yield
	(lb/A)		(%)									(lb/A)
Cocodrie												
Untreated check			0	0	0	0	0	0	0	0	0	7700
Clomazone	0.3	PRE	9	3	1	1	4	0	2	5	0	8030
Clomazone	0.6	PRE	64	38	12	12	31	20	18	36	22	8470
RU9801081												
Untreated check			0	0	0	0	0	0	0	0	0	6770
Clomazone	0.3	PRE	5	4	0	1	1	0	1	1	0	5920
Clomazone	0.6	PRE	54	35	9	6	29	25	14	32	28	5620
Koshihikari												
Untreated check			0	0	0	0	0	0	0	0	0	6340
Clomazone	0.3	PRE	36	6	4	9	5	2	14	5	2	7630
Clomazone	0.6	PRE	40	39	28	9	51	50	19	58	52	8090
RU9601096												
Untreated check			0	0	0	0	0	0	0	0	0	7640
Clomazone	0.3	PRE	29	18	6	12	20	9	21	21	9	7430
Clomazone	0.6	PRE	82	65	32	39	74	71	56	76	75	7600
Jefferson												
Untreated check			0	0	0	0	0	0	0	0	0	6350
Clomazone	0.3	PRE	6	4	0	1	0	0	1	0	0	6670
Clomazone	0.6	PRE	44	29	9	8	16	12	12	21	12	6640
RU9901030												
Untreated check			0	0	0	0	0	0	0	0	0	7150
Clomazone	0.3	PRE	8	4	4	4	2	0	2	2	0	7710
Clomazone	0.6	PRE	64	41	15	14	31	20	20	38	22	8540
LSD for comparing among herbicide treatments for same cultivar			23	13	7	8	8	12	10	8	14	NS
LSD ffor comparing among herbicide treatments for different cultivars			18	13	7	7	8	11	10	8	13	NS

Table 15. Intermittent irrigation in rice, Stuttgart, 2000.

SUMMARY

This experiment evaluated the effects of minimizing the amount of water used throughout the growing season, to the point of not maintaining flooding, on weed control and various rice growth and yield parameters with several standard herbicide programs. Each replication was split into six different bays with irrigation regimes based on different soil moisture contents. The amount of time between the initial loss of the flood until reflooding occurred was varied. Initially all bays were flooded the same day and to the same depth. The flood in each bay was allowed to drop except in those bays designated as permanent flood. When the soil reached the target volumetric water content in each bay, the flood was reintroduced. This allowed for various wetting and drying periods that would simulate a loss of flood for varying intervals in a grower field.

There was no interaction between water management and herbicide treatment. Water management did not affect rice chlorosis from clomazone, visual growth reduction, or injury, and the only differences were due to herbicide treatment. Propanil-resistant and -susceptible barnyardgrass control was >97% for all treatments except thiobencarb (Bolero) followed by fenoxaprop + safener (Ricestar), which gave 84% control, and propanil followed by quinclorac (Facet) + propanil which gave 89% control. Broadleaf signalgrass control followed the same general trends as barnyardgrass control. Rice yield was not affected by any of the herbicide treatments except thiobencarb followed by fenoxaprop + safener. Water management affected rice yield only at the lowest volumetric content of 20%, which resulted in lower yields than the higher water contents, and yield from those bays designated as permanent flood.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 7.3

Planting date ..... May 18, 2000
Harvest date ..... September 14, 2000
Crop / Variety ..... rice / Wells
Dates of flushing ..... May 25 and 30, June 9 and 13, 2000
Date of initial flooding ..... June 27, 2000

Comments: PRE = preemergence; EPOST = early postemergence; PREFL = preflood; POFL-1 = 1 week after initial flood; and POFL-2 = 3 weeks after initial flood.

Application type	PRE	EPOST	PREFL	POFL-1	POFL-2
Date applied	May 18, 2000	June 2, 2000	June 19, 2000	July 5, 2000	July 19, 2000
Time	9:00 pm	1:00 pm	10:00 am	3:00 pm	6:30 pm
Incorporation equipment	N/A	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	82 / 78	95 / 92	86 / 84	95 /	96 /
Relative humidity (%)	83	55	85	86	95
Wind (mph)	3	2	1	2	3
Cloud cover (%)	20	35	50	40	35
Soil moisture	dry	moist	wet		
Crop stage/Height	N/A	2-3 lf / 5"	5-6 lf / 12"	8-9 lf / 28"	10-12 lf / 28"
Sprayer type/mph	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015
Boom ht/# Noz/Spacing (in.)	15 / 3 / 18	21 / 3 / 18	27 / 3 / 18	44 / 3 / 18	44 / 3 / 18
Gpa / Psi	10 / 30	10 / 28	10 / 28	10 / 28	10 / 28
Weed species (density)	---------- [# leaves/height (in.)] ----------				
R-ECHCG (20/ft in row)	N/A	2-3 lf / 1.5"	6 lf / 8-10"	8-10 lf / 13-15"	8-10 lf / 15-16"
S-ECHCG (15/ft in row)	N/A	2 lf / 1.5"	5-6 lf / 8-10"	8-10 lf / 14-16"	8-10 lf / 14-16"
BRAPP (15/ft^2)	N/A	2-3 lf / 1.5"	6-7 lf / 8-10"	10-12 lf / 15-17"	8-10 lf / 15-17"

Table 15. Section 1.

				Barnyardgrass control							
			Application	Susceptible (S-ECHCG)				Resistant (R-ECHCG)			
	Herbicide	Rate	timing	6/8	6/22	7/18	8/17	6/8	6/22	7/18	8/17
			(lb ai/A)	---------- (%) ----------							
Permanent flood:											
1	Untreated check			0	0	0	0	0	0	0	0
2	Clomazone	0.3	PRE	100	94	99	100	100	94	99	100
3	Clomazone	0.6	PRE	100	100	100	100	100	100	100	100
4	Quinclorac	0.375	PRE	100	100	100	100	100	100	100	99
5	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	100	100	100	99	100	100	87	85
6	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	98	69	65	95	98	63	73	85
7	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	59	68	70	86	30	3	54	68
Reflood at 48% soil moisture:											
8	Untreated check			0	0	0	0	0	0	0	0
9	Clomazone	0.3	PRE	100	100	83	99	100	99	96	99
10	Clomazone	0.6	PRE	100	100	100	100	100	100	100	100
11	Quinclorac	0.375	PRE	100	100	100	100	100	100	100	100
12	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	100	98	78	95	100	98	79	94
13	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	97	55	79	82	97	68	90	75
14	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	69	56	96	86	25	3	43	55
Reflood at 41% soil moisture:											
15	Untreated check			0	0	0	0	0	0	0	0
16	Clomazone	0.3	PRE	100	100	99	96	100	100	99	97
17	Clomazone	0.6	PRE	100	100	100	100	100	100	100	100
18	Quinclorac	0.375	PRE	100	100	99	100	100	100	99	100
19	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	100	100	99	99	100	100	99	97
20	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	100	56	75	81	98	70	84	63
21	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	50	60	83	84	23	3	53	60

continued

Table 15. Section 1. Continued.

				Barnyardgrass control							
				Susceptible (S-ECHCG)				Resistant (R-ECHCG)			
	Herbicide	Rate	Application timing	6/8	6/22	7/18	8/17	6/8	6/22	7/18	8/17
			(lb ai/A)	(%)							
Reflood at 34% soil moisture:											
22	Untreated check			0	0	0	0	0	0	0	0
23	Clomazone	0.3	PRE	100	100	98	95	100	100	95	83
24	Clomazone	0.6	PRE	100	100	100	100	100	100	100	100
25	Quinclorac	0.375	PRE	100	100	99	97	100	100	99	92
26	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	100	100	96	97	100	100	96	95
27	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	98	54	65	80	98	65	76	66
28	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	72	54	92	96	39	2	52	45
Reflood at 27% soil moisture:											
29	Untreated check			0	0	0	0	0	0	0	0
30	Clomazone	0.3	PRE	90	96	99	98	100	100	93	92
31	Clomazone	0.6	PRE	100	100	100	99	100	100	100	100
32	Quinclorac	0.375	PRE	100	100	99	98	100	100	95	95
33	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	100	100	96	96	100	100	95	92
34	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	96	44	64	91	97	46	75	60
35	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	78	59	90	97	28	23	48	45
Reflood at 20% soil moisture:											
36	Untreated check			0	13	0	15	0	3	0	10
37	Clomazone	0.3	PRE	100	96	97	97	100	99	97	82
38	Clomazone	0.6	PRE	100	100	100	99	100	100	100	100
39	Quinclorac	0.375	PRE	100	100	100	99	100	100	100	87
40	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	100	99	94	97	100	99	94	92
41	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	98	58	68	76	98	66	71	55
42	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	61	58	91	91	24	0	56	43
	LSD to compare main effect of water treatments			5	6	8	6	4	6	8	14
	LSD To compare main effect of herbicide treatments			4	6	7	5	4	5	7	8

continued

Table 15. Section 2.

				Broadleaf signalgrass (BRAPP) control				Effect on rice: Chlorosis			Effect on rice: Biomass reduction		
	Herbicide	Rate	Application timing	6/8	6/22	7/18	8/17	6/1	6/8	6/16	6/16	6/22	7/11
		(lb ai/A)		(%)									
Permanent flood:													
1	Untreated check			0	0	0	0	0	0	0	0	0	0
2	Clomazone	0.3	PRE	100	91	100	99	0	2	0	0	0	0
3	Clomazone	0.6	PRE	100	100	100	98	5	44	5	0	0	0
4	Quinclorac	0.375	PRE	100	100	100	100	0	0	0	0	0	0
5	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	95	85	98	93	0	0	0	0	0	0
6	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	90	51	74	54	0	0	0	0	0	0
7	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	80	64	75	80	0	0	0	0	0	0
Reflood at 48% soil moisture:													
8	Untreated check			0	0	0	0	0	0	0	0	0	0
9	Clomazone	0.3	PRE	75	100	96	92	0	1	0	0	0	0
10	Clomazone	0.6	PRE	100	100	100	100	7	49	6	0	0	0
11	Quinclorac	0.375	PRE	100	100	100	100	0	0	0	0	0	0
12	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	100	81	81	84	0	0	0	0	0	0
13	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	91	44	74	67	0	0	0	0	0	0
14	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	76	49	95	93	0	0	0	0	0	0
Reflood at 41% soil moisture:													
15	Untreated check			0	0	0	0	0	0	0	0	0	0
16	Clomazone	0.3	PRE	99	98	90	69	0	2	0	0	0	0
17	Clomazone	0.6	PRE	100	100	100	100	2	35	5	0	0	0
18	Quinclorac	0.375	PRE	100	100	100	100	0	0	0	0	0	0
19	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	100	93	96	95	0	0	0	0	0	0
20	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	96	54	68	30	0	0	0	0	0	0
21	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	79	53	97	97	0	0	0	0	0	0

continued

Table 15. Section 2. Continued.

				Broadleaf signalgrass (BRAPP) control				Effect on rice: Chlorosis			Effect on rice: Biomass reduction		
	Herbicide	Rate	Application timing	6/8	6/22	7/18	8/17	6/1	6/8	6/16	6/16	6/22	7/11
		(lb ai/A)		(%)									
Reflood at 34% soil moisture:													
22	Untreated check			0	0	0	0	0	0	0	0	0	0
23	Clomazone	0.3	PRE	100	100	97	82	1	3	1	0	0	0
24	Clomazone	0.6	PRE	100	100	99	100	6	50	8	0	0	0
25	Quinclorac	0.375	PRE	100	100	99	98	1	0	0	0	0	0
26	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	100	95	88	82	0	0	0	0	0	0
27	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	89	48	60	28	0	0	0	0	0	0
28	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	60	43	85	75	0	0	0	0	0	0
Reflood at 27% soil moisture:													
29	Untreated check			0	0	0	0	0	0	0	0	0	0
30	Clomazone	0.3	PRE	100	100	98	92	0	0	0	0	0	0
31	Clomazone	0.6	PRE	100	100	100	100	5	44	6	0	0	0
32	Quinclorac	0.375	PRE	100	100	99	100	0	0	0	0	0	0
33	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	96	88	80	85	0	0	0	0	0	0
34	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	86	38	65	35	0	0	0	0	0	0
35	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	80	58	96	88	0	0	0	0	0	0
Reflood at 20% soil moisture:													
36	Untreated check			0	10	0	10	0	0	0	0	0	0
37	Clomazone	0.3	PRE	100	98	91	68	2	2	0	0	0	0
38	Clomazone	0.6	PRE	100	100	100	97	1	30	5	0	0	0
39	Quinclorac	0.375	PRE	100	100	99	97	0	0	0	0	0	0
40	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	97	74	64	76	0	0	0	0	0	0
41	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	99	64	74	38	0	0	0	0	0	0
42	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	80	61	96	88	0	0	0	0	0	0
	LSD to compare main effect of water treatments			8	8	8	11	7	9	2	NS	NS	NS
	LSD to compare main effect of herbicide treatments			6	8	8	9	3	5	1	NS	NS	NS

continued

Table 15. Section 3.

				Effect on rice					
				Injury			Yield	Panicle height	Harvest index
	Herbicide	Rate	Application timing	6/1	6/8	6/16	9/27	9/27	9/26
		(lb ai/A)		---------- (%) ----------			(lb/A)	(cm)	
Permanent flood:									
1	Untreated check			0	0	0	6256	86	43
2	Clomazone	0.3	PRE	0	0	0	8468	84	49
3	Clomazone	0.6	PRE	0	1	0	9211	92	52
4	Quinclorac	0.375	PRE	0	3	0	10027	90	54
5	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	0	0	0	8612	86	49
6	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	0	0	0	8540	86	50
7	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	0	0	0	8627	88	48
Reflood at 48% soil moisture:									
8	Untreated check			0	0	0	4698	84	39
9	Clomazone	0.3	PRE	0	0	0	8232	89	49
10	Clomazone	0.6	PRE	0	3	0	9467	88	41
11	Quinclorac	0.375	PRE	0	3	0	8905	90	49
12	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	0	0	0	8552	86	49
13	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	0	0	0	7957	87	57
14	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	0	0	0	9222	89	49
Reflood at 41% soil moisture:									
15	Untreated check			0	0	0	3476	78	44
16	Clomazone	0.3	PRE	0	0	0	8602	88	54
17	Clomazone	0.6	PRE	0	1	0	8399	87	49
18	Quinclorac	0.375	PRE	0	4	0	9371	89	58
19	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	0	0	0	7804	87	49
20	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	0	1	0	8384	87	53
21	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	0	0	0	8352	88	50

continued

Table 15. Section 3. Continued.

				Effect on rice					
				Injury			Yield	Panicle height	Harvest index
	Herbicide	Rate	Application timing	6/1	6/8	6/16	9/27	9/27	9/26
		(lb ai/A)		---------- (%) ----------			(lb/A)	(cm)	
Reflood at 34% soil moisture:									
22	Untreated check			0	0	0	3189	80	39
23	Clomazone	0.3	PRE	0	0	0	8929	91	50
24	Clomazone	0.6	PRE	0	5	0	8394	91	47
25	Quinclorac	0.375	PRE	0	4	0	7962	92	55
26	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	0	0	0	8644	88	47
27	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	0	0	0	7165	87	47
28	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	0	0	0	9422	91	54
Reflood at 27% soil moisture:									
29	Untreated check			0	0	0	6086	81	45
30	Clomazone	0.3	PRE	0	0	0	8105	84	49
31	Clomazone	0.6	PRE	0	4	0	7911	87	47
32	Quinclorac	0.375	PRE	0	2	0	7923	86	48
33	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	0	0	0	6987	83	53
34	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	0	0	0	6678	82	45
35	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	0	0	0	7602	88	55
Reflood at 20% soil moisture:									
36	Untreated check			0	0	0	3404	79	44
37	Clomazone	0.3	PRE	0	0	0	5516	81	42
38	Clomazone	0.6	PRE	0	0	0	5306	80	41
39	Quinclorac	0.375	PRE	0	1	0	4795	81	38
40	Pendimethalin *fb* (fenoxaprop + safener)	1.0 0.08	DPRE POFL-2	0	0	0	5456	83	44
41	Thiobencarb *fb* (fenoxaprop + safener)	4.0 0.08	DPRE POFL-1	0	0	0	4330	80	32
42	Propanil *fb* propanil + quinclorac	4.0 4.0 0.375	EPOST PREFLD PREFLD	0	0	0	4916	83	43
	LSD to compare main effect of water treatments			NS	NS	NS	1696	5	4
	LSD to compare main effect of herbicide treatments			NS	NS	NS	760	2	4

Table 16. Liberty-tolerant rice. Stuttgart, 2000.

SUMMARY

Glufosinate (Liberty) was evaluated at 0.186, 0.312, or 0.356 lb ai/A in a sequential program applied at the 2- to 3-leaf and 4- to 6-leaf rice stage. Glufosinate was also evaluated in a program approach with clomazone (Command) or quinclorac (Facet) applied preemergence. Glufosinate at 0.183 was also evaluated at the 2- to 3-leaf stage *fb* the 4- to 6-leaf stage applied alone and in combination with AMS, Class Act, C19804, Placement ProPak, Corral AMS, ARray, Class Act II, or AG-98.

A program approach with either clomazone or quinclorac followed by glufosinate or with sequential applications of glufosinate was needed to control broadleaf signalgrass and propanil-resistant and -susceptible barnyardgrass. Either program was also effective for control of pitted morningglory, tall morningglory, northern jointvetch, hemp sesbania, and bearded sprangletop. Overall, no benefit was seen using one adjuvant system over another for this weed spectrum.

Indirect comparisons with other rice cultivars in 2000 indicate a tendency for more early-season rice chlorosis to be observed when clomazone is used in glufosinate-tolerant Bengal than with conventional cultivars.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 5.2
Planting date ..... May 17, 2000
Harvest date ..... September 21, 2000
Crop / Variety ..... rice / Liberty Bengal
Dates of flushing ..... June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: PRE = preemergence; DPRE = delayed preemergence; 2-3 LF = 2- to 3-leaf rice; EPOST = early postemergence; and PREFL = preflood.

Application type	PRE	2-3 LF	EPOST	PREFL
Date applied	May 18, 2000	May 22, 2000	June 2, 2000	June 19, 2000
Time	10:00 am	4:30 pm	2:30 pm	10:00 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	82 / 78	88 / 77	95 / 92	93 / 84
Relative humidity (%)	83	84	42	85
Wind (mph)	3	4	2	1
Cloud cover (%)	20	100	15	50
Soil moisture	adequate	adequate	adequate	adequate
Crop stage/Height	N/A	N/A	2-3 lf / 5.5"	5-6 lf / 10"
Sprayer type/mph	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3	BkPkCO_2 / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet / DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015
Boom ht / # Noz / Spacing (in.)	16 / 3 / 18	16 / 3 / 18	21 / 3 / 18	29 / 3 / 18
Gpa / Psi	10 / 30	10 / 25	10 / 30	10 / 28
Weed species (density)	----------	[# leaves/height (in.)]	----------	
S-ECHCG (13/ft in row)	N/A	N/A	1-2 lf / 1"	3-4 lf / 2-3"
R-ECHCG (20/ft in row)	N/A	N/A	1-2 lf / 1-1.5"	4-5 lf / 8-9"
N-ECHCG (8-10/ft^2)	N/A	N/A	2 lf / 1.5-2"	4-5 lf / 8-9"
BRAPP (18/ft in row)	N/A	N/A	2 lf / 1-2"	4 lf / 3-4 in
IPOLA (15/ft in row)	N/A	N/A	2-3 lf / 1.5-2"	7-9 lf / 6-7"
PHBPU (12/ft in row)	N/A	N/A	2-3 lf / 1.5"	6-8 lf / 6-8"
AESVI (4/ft in row)	N/A	N/A	1-2 lf / 2"	7-8 lf / 5-7"
SEBEX (40/ft in row)	N/A	N/A	2-3 lf / 4"	8-10 lf / 10-12"
LEFPA (0.1/ft^2)	N/A	N/A	N/A	1 lf / 0.5"

Table 16. Section 1.

				Barnyardgrass control								
			Application	Natural (N-ECHCG)			Susceptible (S-ECHCG)			Resistant (R-ECHCG)		
	Herbicide	Rate	timing	6/15	7/11	/16	6/15	7/11	8/16	6/15	7/11	8/16
		(lb ai/A)		---------- (%) ----------								
1	Untreated check			0	0	0	0	0	0	0	0	0
2	Glufosinate *fb* glufosinate	0.312 0.267	2-3 LF PREFL	76	100	100	79	100	100	80	100	100
3	Glufosinate *fb* glufosinate	0.312 0.223	2-3 LF PREFL	70	100	100	66	100	100	60	100	100
4	Glufosinate *fb* glufosinate	0.356 0.178	2-3 LF PREFL	88	95	100	83	100	100	74	100	100
5	Pendimethalin *fb* glufosinate	1.0 0.312	DPRE PREFL	98	99	100	100	100	100	100	100	100
6	Propanil *fb* glufosinate	4.0 0.312	2-3 LF PREFL	54	100	100	65	100	100	55	100	100
7	Quinclorac + AG-98 *fb* glufosinate	0.375 0.25% 0.312	2-3 LF 2-3 LF PREFL	95	100	100	98	100	100	98	100	100
8	Clomazone *fb* glufosinate	0.4 0.312	PRE PREFL	100	96	100	100	100	100	100	100	100
9	Glufosinate + (propanil + molinate)	0.312 5.35	2-3 LF 2-3 LF	93	61	64	93	83	64	86	59	46
10	Glufosinate + bentazon	0.312 0.75	2-3 LF 2-3 LF	80	54	45	80	79	40	78	60	33
11	Glufosinate + halosulfuron + AG-98	0.312 0.0312 0.25%	2-3 LF 2-3 LF 2-3 LF	87	55	63	92	78	63	90	61	65
12	Clomazone + quinclorac *fb* (propanil + molinate)	0.3 0.19 4.5	PRE PRE PREFL	100	100	100	100	100	100	100	100	100
13	Quinclorac *fb* propanil (Stam M-4)	0.375 4.0	PRE PREFL	97	94	99	97	100	99	99	100	100
14	Glufosinate *fb* glufosinate	0.183 0.183	2-3 LF PREFL	65	88	99	69	100	99	55	100	100
15	Glufosinate + AMS *fb* glufosinate + AMS	0.183 3.0 0.183 3.0	2-3 LF 2-3 LF PREFL PREFL	68	89	97	64	100	97	55	100	85
16	Glufosinate + Class Act *fb* glufosinate + Class Act	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	71	88	99	83	100	99	86	100	100
17	Glufosinate + CL9804 *fb* glufosinate + CL9804	0.183 1.0 0.183 1.0	2-3 LF 2-3 LF PREFL PREFL	55	90	99	68	100	99	48	100	100
18	Glufosinate + Placement Pro-Pak *fb* glufosinate + Placement Pro-Pak	0.183 1.0 0.183 1.0	2-3 LF 2-3 LF PREFL PREFL	55	91	99	54	100	99	58	100	99
19	Glufosinate + Corral AMS *fb* glufosinate + Corral AMS	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	59	88	98	55	100	98	54	100	99

continued

Table 16. Section 1. Continued.

				Barnyardgrass control								
			Application	Natural (N-ECHCG)			Susceptible (S-ECHCG)			Resistant (R-ECHCG)		
	Herbicide	Rate	timing	6/15	7/11	/16	6/15	7/11	8/16	6/15	7/11	8/16
		(lb ai/A)		---------- (%) ----------								
20	Glufosinate + Array *fb* glufosinate + Array	0.183 1.4 0.183 1.4	2-3 LF 2-3 LF PREFL PREFL	58	85	99	58	100	99	65	100	100
21	Glufosinate + Class Act II *fb* glufosinate *fb* Class Act II	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	75	94	98	79	100	98	75	100	99
22	Glufosinate + AG-98 *fb* glufosinate + AG-98	0.183 0.25% 0.183 0.25%	2-3 LF 2-3 LF PREFL PREFL	66	100	100	61	100	100	54	100	100
23	Glufosinate *fb* glufosinate	0.365 0.365	2-3 LF PREFL	78	98	100	80	100	100	79	100	100
LSD (0.05)				21	10	12	21	9	12	22	12	13

continued

Table 16. Section 2.

				Weed control								
			Application	Broadleaf signalgrass (BRAPP)			Pitted morningglory (IPOLA)			Tall morningglory (PHBPU)		
	Herbicide	Rate	timing	6/15	7/11	/16	6/15	7/11	8/16	6/15	7/11	8/16
		(lb ai/A)		---------- (%) ----------								
1	Untreated check			0	0	0	0	0	0	0	0	0
2	Glufosinate *fb* glufosinate	0.312 0.267	2-3 LF PREFL	82	100	100	20	100	100	25	100	100
3	Glufosinate *fb* glufosinate	0.312 0.223	2-3 LF PREFL	64	100	100	33	100	100	34	100	100
4	Glufosinate *fb* glufosinate	0.356 0.178	2-3 LF PREFL	78	100	100	30	100	100	39	100	100
5	Pendimethalin *fb* glufosinate	1.0 0.312	DPRE PREFL	95	100	100	18	100	100	20	100	100
6	Propanil *fb* glufosinate	4.0 0.312	2-3 LF PREFL	79	100	100	25	100	100	34	100	100
7	Quinclorac + AG-98 *fb* glufosinate	0.375 0.25% 0.312	2-3 LF 2-3 LF PREFL	100	100	100	46	100	100	86	100	100
8	Clomazone *fb* glufosinate	0.4 0.312	PRE PREFL	100	100	100	23	100	100	31	100	100
9	Glufosinate + (propanil + molinate)	0.312 5.35	2-3 LF 2-3 LF	90	100	65	50	55	20	60	63	28
10	Glufosinate + bentazon	0.312 0.75	2-3 LF 2-3 LF	80	100	38	28	69	25	31	69	25
11	Glufosinate + halosulfuron + AG-98	0.312 0.0312 0.25%	2-3 LF 2-3 LF 2-3 LF	86	100	64	49	76	39	43	76	30

continued

Table 16. Section 2. Continued.

				Weed control								
				Broadleaf signalgrass (BRAPP)			Pitted morningglory (IPOLA)			Tall morningglory (PHBPU)		
	Herbicide	Rate	Application timing	6/15	7/11	/16	6/15	7/11	8/16	6/15	7/11	8/16
		(lb ai/A)		---------- (%) ----------								
12	Clomazone + quinclorac *fb* (propanil + molinate)	0.3 0.19 4.5	PRE PRE PREFL	100	100	100	94	100	100	100	100	100
13	Quinclorac *fb* propanil (Stam M-4)	0.375 4.0	PRE PREFL	100	100	100	95	100	100	100	100	100
14	Glufosinate *fb* glufosinate	0.183 0.183	2-3 LF PREFL	55	100	100	18	100	100	25	100	100
15	Glufosinate + AMS *fb* glufosinate + AMS	0.183 3.0 0.183 3.0	2-3 LF 2-3 LF PREFL PREFL	59	100	100	23	100	100	23	100	100
16	Glufosinate + Class Act *fb* glufosinate + Class Act	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	68	100	100	20	100	100	23	100	100
17	Glufosinate + CL9804 *fb* glufosinate + CL9804	0.183 1.0 0.183 1.0	2-3 LF 2-3 LF PREFL PREFL	56	100	100	13	100	100	25	100	100
18	Glufosinate + Placement Pro-Pak *fb* glufosinate + Placement Pro-Pak	0.183 1.0 0.183 1.0	2-3 LF 2-3 LF PREFL PREFL	60	100	100	10	100	100	33	100	100
19	Glufosinate + Corral AMS *fb* glufosinate + Corral AMS	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	56	100	100	18	100	95	21	100	95
20	Glufosinate + Array *fb* glufosinate + Array	0.183 1.4 0.183 1.4	2-3 LF 2-3 LF PREFL PREFL	54	100	100	20	100	96	28	100	96
21	Glufosinate + Class Act II *fb* glufosinate *fb* Class Act II	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	68	100	100	23	100	100	31	100	100
22	Glufosinate + AG-98 *fb* glufosinate + AG-98	0.183 0.25% 0.183 0.25%	2-3 LF 2-3 LF PREFL PREFL	58	100	100	18	100	100	33	100	100
23	Glufosinate *fb* glufosinate	0.365 0.365	2-3 LF PREFL	70	100	100	20	100	99	33	100	99
	LSD (0.05)			19	0	13	13	13	10	18	12	12

continued

Table 16. Section 3.

				Weed control							
				Northern jointvetch (AESVI)			Hemp sesbania (SEBEX)			Amazon sprangletop (LEFPA)	
	Herbicide	Rate	Application timing	6/15	7/11	/16	6/15	7/11	8/16	8/16	
		(lb ai/A)		---------- (%) ----------							
1	Untreated check			0	0	0	0	0	0	0	
2	Glufosinate *fb* glufosinate	0.312 0.267	2-3 LF PREFL	64	100	99	95	100	100	100	
3	Glufosinate *fb* glufosinate	0.312 0.223	2-3 LF PREFL	74	100	98	93	99	99	100	
4	Glufosinate *fb* glufosinate	0.356 0.178	2-3 LF PREFL	80	100	99	96	100	100	100	
5	Pendimethalin *fb* glufosinate	1.0 0.312	DPRE PREFL	13	100	100	23	100	100	100	
6	Propanil *fb* glufosinate	4.0 0.312	2-3 LF PREFL	81	100	100	96	100	100	100	
7	Quinclorac + AG-98 *fb* glufosinate	0.375 0.25% 0.312	2-3 LF 2-3 LF PREFL	81	100	100	88	100	100	100	
8	Clomazone *fb* glufosinate	0.4 0.312	PRE PREFL	40	100	100	8	100	100	100	
9	Glufosinate + (propanil + molinate)	0.312 5.35	2-3 LF 2-3 LF	83	55	13	96	81	31	91	
10	Glufosinate + bentazon	0.312 0.75	2-3 LF 2-3 LF	75	55	25	97	85	55	65	
11	Glufosinate + halosulfuron + AG-98	0.312 0.0312 0.25%	2-3 LF 2-3 LF 2-3 LF	86	78	43	98	86	61	90	
12	Clomazone + quinclorac *fb* (propanil + molinate)	0.3 0.19 4.5	PRE PRE PREFL	89	100	93	93	100	100	100	
13	Quinclorac *fb* propanil (Stam M-4)	0.375 4.0	PRE PREFL	97	100	100	97	100	100	73	
14	Glufosinate *fb* glufosinate	0.183 0.183	2-3 LF PREFL	78	100	100	96	100	100	100	
15	Glufosinate + AMS *fb* glufosinate + AMS	0.183 3.0 0.183 3.0	2-3 LF 2-3 LF PREFL PREFL	75	100	97	96	99	98	100	
16	Glufosinate + Class Act *fb* glufosinate + Class Act	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	53	100	100	91	100	100	100	
17	Glufosinate + CL9804 *fb* glufosinate + CL9804	0.183 1.0 0.183 1.0	2-3 LF 2-3 LF PREFL PREFL	60	100	100	89	100	100	100	
18	Glufosinate + Placement Pro-Pak *fb* glufosinate + Placement Pro-Pak	0.183 1.0 0.183 1.0	2-3 LF 2-3 LF PREFL PREFL	46	100	96	70	100	100	100	

continued

Table 16. Section 3. Continued.

				Weed control							
				Northern jointvetch (AESVI)			Hemp sesbania (SEBEX)			Amazon sprangletop (LEFPA)	
	Herbicide	Rate	Application timing	6/15	7/11	/16	6/15	7/11	8/16	8/16	
		(lb ai/A)		---------- (%) ----------							
19	Glufosinate + Corral AMS *fb* glufosinate + Corral AMS	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	53	100	99	86	99	100	100	
20	Glufosinate + Array *fb* glufosinate + Array	0.183 1.4 0.183 1.4	2-3 LF 2-3 LF PREFL PREFL	35	100	100	88	100	100	100	
21	Glufosinate + Class Act II *fb* glufosinate *fb* Class Act II	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	63	100	100	91	100	100	100	
22	Glufosinate + AG-98 *fb* glufosinate + AG-98	0.183 0.25% 0.183 0.25%	2-3 LF 2-3 LF PREFL PREFL	60	100	100	97	100	100	100	
23	Glufosinate *fb* glufosinate	0.365 0.365	2-3 LF PREFL	66	100	100	94	100	100	100	
	LSD (0.05)			23	11	6	11	7	20	13	

continued

Table 16. Section 4.

				Effect on rice							
				Chlorosis				Biomass reduction			
	Herbicide	Rate	Application timing	6/1	6/9	6/15	6/22	6/1	6/9	6/15	6/22
		(lb ai/A)		---------- (%) ----------							
1	Untreated check			0	0	0	0	0	0	0	0
2	Glufosinate *fb* glufosinate	0.312 0.267	2-3 LF PREFL	0	0	0	0	0	0	0	0
3	Glufosinate *fb* glufosinate	0.312 0.223	2-3 LF PREFL	0	0	0	0	0	0	0	0
4	Glufosinate *fb* glufosinate	0.356 0.178	2-3 LF PREFL	0	0	0	0	0	0	0	0
5	Pendimethalin *fb* glufosinate	1.0 0.312	DPRE PREFL	0	0	0	0	0	0	0	0
6	Propanil *fb* glufosinate	4.0 0.312	2-3 LF PREFL	0	0	0	0	0	0	0	0
7	Quinclorac + AG-98 *fb* glufosinate	0.375 0.25% 0.312	2-3 LF 2-3 LF PREFL	0	0	0	0	0	0	0	0
8	Clomazone *fb* glufosinate	0.4 0.312	PRE PREFL	60	54	23	13	11	16	29	16
9	Glufosinate + (propanil + molinate)	0.312 5.35	2-3 LF 2-3 LF	0	0	0	0	0	0	0	0

continued

Table 16. Section 4. Continued.

	Herbicide	Rate	Application timing	Effect on rice: Chlorosis 6/1	Chlorosis 6/9	Chlorosis 6/15	Chlorosis 6/22	Biomass reduction 6/1	Biomass reduction 6/9	Biomass reduction 6/15	Biomass reduction 6/22
		(lb ai/A)		---------- (%) ----------							
10	Glufosinate + bentazon	0.312 0.75	2-3 LF 2-3 LF	0	0	0	0	0	0	0	0
11	Glufosinate + halosulfuron + AG-98	0.312 0.0312 0.25%	2-3 LF 2-3 LF 2-3 LF	0	0	0	0	0	0	0	0
12	Clomazone + quinclorac *fb* (propanil + molinate)	0.3 0.19 4.5	PRE PRE PREFL	53	44	11	5	5	5	13	5
13	Quinclorac *fb* propanil (Stam M-4)	0.375 4.0	PRE PREFL	0	0	0	0	5	3	3	1
14	Glufosinate *fb* glufosinate	0.183 0.183	2-3 LF PREFL	0	0	0	0	0	0	0	0
15	Glufosinate + AMS *fb* glufosinate + AMS	0.183 3.0 0.183 3.0	2-3 LF 2-3 LF PREFL PREFL	0	0	0	0	0	0	0	0
16	Glufosinate + Class Act *fb* glufosinate + Class Act	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	0	0	0	0	0	0	0	0
17	Glufosinate + CL9804 *fb* glufosinate + CL9804	0.183 1.0 0.183 1.0	2-3 LF 2-3 LF PREFL PREFL	0	0	0	0	0	0	0	0
18	Glufosinate + Placement Pro-Pak *fb* glufosinate + Placement Pro-Pak	0.183 1.0 0.183 1.0	2-3 LF 2-3 LF PREFL PREFL	0	0	0	0	0	0	0	0
19	Glufosinate + Corral AMS *fb* glufosinate + Corral AMS	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	0	0	0	0	0	0	0	0
20	Glufosinate + Array *fb* glufosinate + Array	0.183 1.4 0.183 1.4	2-3 LF 2-3 LF PREFL PREFL	0	0	0	0	0	0	0	0
21	Glufosinate + Class Act II *fb* glufosinate *fb* Class Act II	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	0	0	0	0	0	0	0	0
22	Glufosinate + AG-98 *fb* glufosinate + AG-98	0.183 0.25% 0.183 0.25%	2-3 LF 2-3 LF PREFL PREFL	0	0	0	0	0	0	0	0
23	Glufosinate *fb* glufosinate	0.365 0.365	2-3 LF PREFL	0	0	0	0	0	0	0	0
	LSD (0.05)			2	4	3	1	3	3	6	4

continued

Table 16. Section 5.

	Herbicide	Rate	Application timing	Effect on rice: Injury 6/1	Injury 6/9	Injury 6/15	Injury 6/22	Yield 9/21
		(lb ai/A)		---------- (%) ----------				(lb/A)
1	Untreated check			0	0	0	0	799
2	Glufosinate *fb* glufosinate	0.312 0.267	2-3 LF PREFL	0	0	0	0	7613
3	Glufosinate *fb* glufosinate	0.312 0.223	2-3 LF PREFL	0	0	0	0	7358
4	Glufosinate *fb* glufosinate	0.356 0.178	2-3 LF PREFL	0	0	0	0	7810
5	Pendimethalin *fb* glufosinate	1.0 0.312	DPRE PREFL	0	0	0	0	8229
6	Propanil *fb* glufosinate	4.0 0.312	2-3 LF PREFL	0	0	0	0	8356
7	Quinclorac + AG-98 *fb* glufosinate	0.375 0.25% 0.312	2-3 LF 2-3 LF PREFL	0	1	0	0	7960
8	Clomazone *fb* glufosinate	0.4 0.312	PRE PREFL	9	11	28	16	7916
9	Glufosinate + (propanil + molinate)	0.312 5.35	2-3 LF 2-3 LF	0	0	0	0	5421
10	Glufosinate + bentazon	0.312 0.75	2-3 LF 2-3 LF	0	0	0	0	3415
11	Glufosinate + halosulfuron + AG-98	0.312 0.0312 0.25%	2-3 LF 2-3 LF 2-3 LF	0	0	0	0	5540
12	Clomazone + quinclorac *fb* (propanil + molinate)	0.3 0.19 4.5	PRE PRE PREFL	14	20	14	10	8524
13	Quinclorac *fb* propanil (Stam M-4)	0.375 4.0	PRE PREFL	8	11	5	4	6434
14	Glufosinate *fb* glufosinate	0.183 0.183	2-3 LF PREFL	0	3	0	0	7881
15	Glufosinate + AMS *fb* glufosinate + AMS	0.183 3.0 0.183 3.0	2-3 LF 2-3 LF PREFL PREFL	0	1	0	0	6912
16	Glufosinate + Class Act *fb* glufosinate + Class Act	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	0	0	0	0	7329
17	Glufosinate + CL9804 *fb* glufosinate + CL9804	0.183 1.0 0.183 1.0	2-3 LF 2-3 LF PREFL PREFL	0	0	0	0	6738
18	Glufosinate + Placement Pro-Pak *fb* glufosinate + Placement Pro-Pak	0.183 1.0 0.183 1.0	2-3 LF 2-3 LF PREFL PREFL	0	0	0	0	8206
19	Glufosinate + Corral AMS *fb* glufosinate + Corral AMS	0.183 2.5 0.183 2.5	2-3 LF 2-3 LF PREFL PREFL	0	0	0	0	7721

continued

Table 16. Section 5. Continued.

	Herbicide	Rate	Application timing	Effect on rice: Injury 6/1	Injury 6/9	Injury 6/15	Injury 6/22	Yield 9/21
		(lb ai/A)		---------- (%) ----------				(lb/A)
20	Glufosinate +	0.183	2-3 LF	0	0	0	0	8261
	Array *fb*	1.4	2-3 LF					
	glufosinate +	0.183	PREFL					
	Array	1.4	PREFL					
21	Glufosinate +	0.183	2-3 LF	0	0	0	0	8203
	Class Act II *fb*	2.5	2-3 LF					
	glufosinate *fb*	0.183	PREFL					
	Class Act II	2.5	PREFL					
22	Glufosinate +	0.183	2-3 LF	0	0	0	0	8534
	AG-98 *fb*	0.25%	2-3 LF					
	glufosinate +	0.183	PREFL					
	AG-98	0.25%	PREFL					
23	Glufosinate *fb*	0.365	2-3 LF	0	0	0	0	7986
	glufosinate	0.365	PREFL					
	LSD (0.05)			2	6	5	3	1524

Table 17. CGA-362622 on Clearfield rice, Stuttgart, 2000.

SUMMARY

CGA-362622 (proposed common name, trifloxysulfuron), a sulfonylurea compound, is currently being evaluated as a potential postemergence cotton herbicide. This research examined the potential tolerance of imazethapyr-tolerant rice (Clearfield rice 3510) to CGA-362622. CGA-362622 was used at 0.0023, 0.0047, and 0.0094 lb ai/A applied at the 2- to 3-leaf rice stage or at the 4- to 6-leaf rice stage applied alone and as sequential applications. Imazethapyr (NEWPATH) was also evaluated alone at 0.063 lb ai/A and in combination with several recommended rice herbicides.

Propanil-resistant and -susceptible barnyardgrass control was obtained with imazethapyr programs and with CGA-362622 at 0.0047 and 0.0094 lb/A. All programs except CGA-362622 applied at 0.0023 lb/A provided control of broadleaf signalgrass. Tall morningglory control ranged from 77 to 100% with various imazethapyr programs, but was controlled 100% with all CGA-362622 rates. Imazethapyr needed to be used in a program with propanil or quinclorac to control northern jointvetch and hemp sesbania. CGA-362622 provided >90% control of both northern jointvetch and hemp sesbania when applied alone at 4- to 5-leaf rice or in a sequential program. Bearded sprangletop was controlled with imazethapyr or CGA-362622 applied at 0.0094 lb/A. CGA-362622 was the only herbicide causing noticeable rice injury (6 to 32%) and was the only herbicide that delayed rice heading (2 to 6 days) at the higher rate of 0.0094 lb/A.

Yield was taken on this early-season cultivar, and few differences in yield were observed between CGA-362622 and imazethapyr programs. The failure to detect differences, however, can partially be due to the low yield potential of this rice cultivar (70 to 90 bu/A). Future research should be conducted on newer Clearfield rice lines being developed to determine if yield reduction will occur.

TEST INFORMATION

Location ..... Stuttgart
Experimental Design / replications ..... RCB / 4
Plot size ..... 6 ft x 16 ft
Row width / Number of rows per plot ..... 7 in. / 7
Soil type ... Dewitt silt loam (8% sand, 75% silt, 16% clay)
% OM / pH ..... 0.94 / 5.2
Planting date ..... May 17, 2000
Harvest date ..... N/A
Crop / Variety ..... rice / Clearfield rice (3510)
Dates of flushing ..... June 9 and 13, 2000
Date of Flooding ..... June 27, 2000

Comments: PRE = preemergence; EPOST = early postemergence; MIDPOST = mid-postemergence; and PREFL = preflood.

Application type	PRE	EPOST	MIDPOST	PREFL
Date applied	May 18, 2000	June 2, 2000	June 12, 2000	June 19, 2000
Time	10:00 am	2:30 pm	7:00 pm	10:00 am
Incorporation equipment	N/A	N/A	N/A	N/A
Air/Soil temperature (F)	82 / 78	95 / 92	93 / 84	93 / 84
Relative humidity (%)	83	42	62	85
Wind (mph)	3	2	3	1
Cloud cover (%)	20	15	40	50
Soil moisture	adequate	adequate	adequate	adequate
Crop stage/Height	N/A	2-3 lf / 5.5"	4 lf / 8"	5-6 lf / 10"
Sprayer type/mph	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3	BkPkCO$_2$ / 3
Nozzle type/Size	T-Jet DG / 110015	T-Jet / DG / 110015	T-Jet DG / 110015	T-Jet DG / 110015
Boom ht / # Noz / Spacing (in.)	16 / 3 / 18	21 / 3 / 18	29 / 3 / 18	/ 3 / 18
Gpa / Psi	10 / 30	10 / 30	10 / 28	15 / 38
Weed species (density)	---------- [# leaves/height (in.)] ----------			
S-ECHCG (13/ft in row)	N/A	1-2 lf / 1"	3 lf / 2-3"	4 lf / 8-9"
R-ECHCG (13/ft in row)	N/A	2-3 lf / 2-3"	3-4 lf / 4"	5 lf / 8-10"
N-ECHCG (8-10/ft^2)	N/A	2-3 lf / 3-4"	4 lf / 4-5"	5-6 lf / 8-10"
BRAPP (20/ft in row)	N/A	2-3 lf / 1-2"	3-4 lf / 3-4"	4-5 lf / 5-7"
PHBPU (13/ft in row)	N/A	3 lf / 1-2"	4 lf / 2-3"	11 lf / 5-6"
AESVI (4/ft in row)	N/A	4 lf / 1-2"	4-5 lf / 3-4"	7 lf / 6-7"
SEBEX (28/ft in row)	N/A	3 lf / 3-4"	4-5 lf / 8-9"	13 lf / 9-10"
LEFPA (0.25/ft^2)	N/A	N/A	N/A	1 lf / 0.5"

Table 17. Section 1.

				Barnyardgrass control								
				Natural (N-ECHCG)			Susceptible (S-ECHCG)		Resistant (R-ECHCG)		
	Herbicide	Rate	Application timing	6/9	6/28	7/18	6/28	7/18	6/1	6/28	7/18
		(lb ai/A)		---------- (%) ----------							
1	Untreated check			0	0	0	0	0	0	0	0
2	Imazethapyr	0.063	PRE	97	100	100	100	100	88	100	100
3	Imazethapyr *fb*	0.063	PRE	97	100	97	96	97	94	96	97
	imazethapyr +	0.063	MPOST								
	AG-98	0.25%	MPOST								
4	Imazethapyr *fb*	0.063	PRE	98	100	100	100	100	95	100	100
	propanil	4.0	MPOST								
5	Imazethapyr *fb*	0.063	PRE	98	100	100	100	100	96	100	100
	propanil +	4.0	MPOST								
	quinclorac	0.25	MPOST								
6	Imazethapyr *fb*	0.063	PRE	97	100	100	100	100	93	100	100
	propanil +	4.0	MPOST								
	pendimethalin	1.0	MPOST								
7	Propanil	4.0	MPOST	0	83	0	65	0	0	53	0
8	Propanil *fb*	4.0	EPOST	61	88	0	38	0	0	35	0
	propanil	4.0	MPOST								
9	Propanil +	4.0	MPOST	0	100	33	73	35	0	73	30
	quinclorac	0.25	MPOST								
10	Propanil +	4.0	MPOST	0	65	0	53	0	0	30	0
	pendimethalin	1.0	MPOST								
11	CGA-362622 +	0.0023	EPOST	92	95	74	96	74	0	96	71
	AG-98	0.25%	EPOST								
12	CGA-362622 +	0.0047	EPOST	92	100	96	100	98	0	100	98
	AG-98	0.25%	EPOST								
13	CGA-362622 +	0.0094	EPOST	95	100	99	100	99	0	100	99
	AG-98	0.25%	EPOST								
14	CGA-362622 +	0.0023	PREFL	0	55	53	58	56	0	58	59
	AG-98	0.25%	PREFL								
15	CGA-362622 +	0.0047	PREFL	0	99	99	71	100	0	71	100
	AG-98	0.25%	PREFL								
16	CGA-362622 +	0.0094	PREFL	0	80	100	75	100	0	75	100
	AG-98	0.25%	PREFL								
17	CGA-362622 +	0.0023	EPOST	93	99	100	99	100	0	99	100
	AG-98 *fb*	0.25%	EPOST								
	CGA-362622 +	0.0023	PREFL								
	AG-98	0.25%	PREFL								
18	CGA-362622 +	0.0047	EPOST	97	100	99	99	100	0	99	100
	AG-98 *fb*	0.25%	EPOST								
	CGA-362622 +	0.0047	PREFL								
	AG-98	0.25%	PREFL								
19	CGA-362622 +	0.0094	EPOST	97	100	100	100	100	0	100	100
	AG-98 *fb*	0.25%	EPOST								
	CGA-362622 +	0.0094	PREFL								
	AG-98	0.25%	PREFL								
	LSD (0.05)			10	15	13	20	14	4	17	15

continued

Table 17. Section 2.

				Weed control								
				Broadleaf signalgrass (BRAPP)			Tall morningglory (PHBPU)			Northern jointvetch (AESVI)		
	Herbicide	Rate	Application timing	6/9	6/28	7/18	6/9	6/28	7/18	6/9	6/28	7/18
		(lb ai/A)		---------- (%) ----------								
1	Untreated check			0	0	0	0	0	0	0	0	0
2	Imazethapyr	0.063	PRE	95	96	100	75	88	97	0	28	0
3	Imazethapyr *fb*	0.063	PRE	83	90	100	75	78	100	0	28	15
	imazethapyr +	0.063	MPOST									
	AG-98	0.25	MPOST									
4	Imazethapyr *fb*	0.063	PRE	95	100	100	89	89	100	0	63	10
	propanil	4.0	MPOST									
5	Imazethapyr *fb*	0.063	PRE	96	100	100	78	100	100	0	100	100
	propanil +	4.0	MPOST									
	quinclorac	0.25	MPOST									
6	Imazethapyr *fb*	0.063	PRE	96	100	100	89	93	99	0	83	48
	propanil +	4.0	MPOST									
	pendimethalin	1.0	MPOST									
7	Propanil	4.0	MPOST	0	48	96	0	33	10	0	75	55
8	Propanil *fb*	4.0	EPOST	88	93	100	49	48	10	98	100	94
	propanil	4.0	MPOST									
9	Propanil +	4.0	MPOST	0	88	100	0	94	95	0	100	83
	quinclorac	0.25	MPOST									
10	Propanil +	4.0	MPOST	0	35	100	0	49	18	0	70	45
	pendimethalin	1.0	MPOST									
11	CGA-362622 +	0.0023	EPOST	91	93	100	61	38	5	93	83	25
	AG-98	0.25	EPOST									
12	CGA-362622 +	0.0047	EPOST	90	100	100	66	80	65	96	93	58
	AG-98	0.25	EPOST									
13	CGA-362622 +	0.0094	EPOST	94	100	100	73	68	88	96	94	75
	AG-98	0.25	EPOST									
14	CGA-362622 +	0.0023	PREFL	0	38	98	0	30	95	0	88	94
	AG-98	0.25	PREFL									
15	CGA-362622 +	0.0047	PREFL	0	33	60	0	38	100	0	94	93
	AG-98	0.25	PREFL									
16	CGA-362622 +	0.0094	PREFL	0	45	93	0	23	100	0	99	100
	AG-98	0.25	PREFL									
17	CGA-362622 +	0.0023	EPOST	94	99	100	51	36	100	91	100	98
	AG-98 *fb*	0.25	EPOST									
	CGA-362622 +	0.0023	PREFL									
	AG-98	0.25	PREFL									
18	CGA-362622 +	0.0047	EPOST	96	100	100	68	55	100	96	100	90
	AG-98 *fb*	0.25	EPOST									
	CGA-362622 +	0.0047	PREFL									
	AG-98	0.25	PREFL									
19	CGA-362622 +	0.0094	EPOST	93	100	100	71	85	100	95	100	98
	AG-98 *fb*	0.25	EPOST									
	CGA-362622 +	0.0094	PREFL									
	AG-98	0.25	PREFL									
	LSD (0.05)			9	18	8	11	20	8	2	19	20

continued

Table 17. Section 3.

				Weed control				Effect on rice			
				Hemp sesbania (SEBEX)			Bearded sprangletop (LEFFA)	Injury			Days to 50%
	Herbicide	Rate	Application timing	6/9	6/28	7/18	7/18	6/15	6/28	7/18	heading
		(lb ai/A)		---------- (%) ----------							(DAE)[z]
1	Untreated check			0	0	0	0	0	0	0	54
2	Imazethapyr	0.063	PRE	0	0	0	92	0	0	0	54
3	Imazethapyr *fb*	0.063	PRE	0	0	0	92	0	15	0	54
	imazethapyr +	0.063	MPOST								
	AG-98	0.25	MPOST								
4	Imazethapyr *fb*	0.063	PRE	5	93	83	91	0	0	0	55
	propanil	4.0	MPOST								
5	Imazethapyr *fb*	0.063	PRE	5	100	100	90	5	3	0	55
	propanil +	4.0	MPOST								
	quinclorac	0.25	MPOST								
6	Imazethapyr *fb*	0.063	PRE	13	99	90	93	0	0	3	55
	propanil +	4.0	MPOST								
	pendimethalin	1.0	MPOST								
7	Propanil	4.0	MPOST	0	92	75	50	0	0	0	54
8	Propanil *fb*	4.0	EPOST	98	95	82	48	0	0	0	54
	propanil	4.0	MPOST								
9	Propanil +	4.0	MPOST	0	100	85	55	0	0	0	55
	quinclorac	0.25	MPOST								
10	Propanil +	4.0	MPOST	0	92	86	50	0	0	0	54
	pendimethalin	1.0	MPOST								
11	CGA-362622 +	0.0023	EPOST	75	85	60	76	0	0	0	54
	AG-98	0.25	EPOST								
12	CGA-362622 +	0.0047	EPOST	91	96	89	90	5	0	0	54
	AG-98	0.25	EPOST								
13	CGA-362622 +	0.0094	EPOST	94	98	90	92	4	3	0	54
	AG-98	0.25	EPOST								
14	CGA-362622 +	0.0023	PREFL	0	53	95	50	0	23	0	56
	AG-98	0.25	PREFL								
15	CGA-362622 +	0.0047	PREFL	0	86	100	53	0	20	11	57
	AG-98	0.25	PREFL								
16	CGA-362622 +	0.0094	PREFL	0	91	100	83	0	28	26	60
	AG-98	0.25	PREFL								
17	CGA-362622 +	0.0023	EPOST	78	98	100	91	0	6	5	56
	AG-98 *fb*	0.25	EPOST								
	CGA-362622 +	0.0023	PREFL								
	AG-98	0.25	PREFL								
18	CGA-362622 +	0.0047	EPOST	95	100	97	96	5	13	15	58
	AG-98 *fb*	0.25	EPOST								
	CGA-362622 +	0.0047	PREFL								
	AG-98	0.25	PREFL								
19	CGA-362622 +	0.0094	EPOST	95	100	100	99	3	33	39	60
	AG-98 *fb*	0.25	EPOST								
	CGA-362622 +	0.0094	PREFL								
	AG-98	0.25	PREFL								
	LSD (0.05)			8	9	13	17	4	7	5	2

[z] DAE = days after emergence.

Appendix Table 1. Common and trade names, formulation (pounds of active ingredient or acid equivalent per gallon), sponsoring companies, and chemical names of herbicides.[z]

Common name	Trade name (formulation[y])	Company	Chemical name
acifluorfen	Blazer (2 SL)	BASF	5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoic acid
acifluorfen + bentazon	Storm (4 SL)	BASF	5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoic acid + 3-(1-methylethyl)-(1*H*)-2,1,3-benzothiadiazin-4(3*H*)-one 2,2-dioxide
AG-98 (surfactant)	AG-98	Rohm & Haas	–
Agri-Dex (crop oil)	Agri-Dex	Helena	–
AMS (adjuvant)	AMS	–	–
Array (adjuvant)	Array	Intec	–
bensulfuron	Londax (60 DF)	DuPont	2-[[[[[(4,6-dimethoxy-2-pyrimidinyl)amino]carbonyl] amino]sulfonyl]methyl]benzoic acid
bentazon	Basagran (4 SL)	BASF	3-(1-methylethyl)-(1*H*)-2,1,3-benzothiadiazin-4(3*H*)-one 2,2-dioxide
bispyribac-sodium (formerly V-10029)	Regiment (80 WP)	Valent	sodium 2,6-bis[(4,6-dimethoxypryimidin-2-yl)oxy] benzoate
carfentrazone	Aim (40 DF)	FMC	*N*-[2,4-dichloro-5-(4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1*H*-1,2,4-triazol)-1-ylphenyl]-methanesulfonamide
CGA-362622	–	Syngenta	–
CL9804 (adjuvant)	CL9804		N-[[(4,6-dimethyoxy-2-pyrimidinyl)amino]carbonyl]-3-(2,2,2-trifluoroethoxy)-2-pyridine sulfonamide
Class Act (adjuvant)	Class Act	Wilfarm	–
Class Act II (adjuvant)	Class Act II	Wilfarm	–
clefoxydim (BAS 625H)	Aura (1.67 EC)	BASF	2-[1-(2-(4-chlorophenoxy)propoxyimino)butyl]-3-oxo-5-thione-3-ylcyclohex-1-enol
clomazone	Command (3 ME)	FMC	2-[(2-chlorophenyl)methyl]-4,4-dimethyl-3-isoxazolidinone
Corral AMS (adjuvant)	Corral AMS	Wilfarm	–
Crop Oil Plus (adjuvant)	Crop Oil Plus	Wilfarm	
cyhalofop (formerly DE-537)	Clincher (2.38 EC)	Dow AgroSciences	(*R*)-2-[4-(4-cyano-2-fluorophenoxy)phenoxy] propanoic acid
Eth-N-Gard (adjuvant)	Eth-N-Gard	Wilfarm	
fenoxaprop	Whip (1EC); Whip 360 (0.57 EC)	AgrEvo	(+)-2-[4-[(6-chloro-2-benzoxazolyl)oxy]phenoxy] propanoic acid
fenoxaprop + safener (isoxadifen)	Ricestar (1.2 EC)	AgrEvo	(see fenoxaprop)
glufosinate	Liberty (1.67 EC)	AgrEvo	2-amino-4-(hydroxymethylphosphinyl)butanoic acid
glyphosate	Roundup Ultra (4 SL)	Monsanto	*N*-(phosphonomethyl)glycine
halosulfuron	Permit (75 DF)	Monsanto	3-chloro-5-[[[[(4,6-dimethoxy-2-pyrimidinyl)amino] carbonyl]amino]-sulfonyl]-1-methyl-1H-pyrazole-4-carboxylic acid

continued

Appendix Table 1. Continued.

Common name	Trade name (formulation[y])	Company	Chemical name
Hasten (adjuvant)	Hasten	Wilfarm	
Hi-Per-Oil (adjuvant)	Hi-Per-Oil	Wilfarm	
imazethapyr	Pursuit (5L, 70 WG) NEWPATH (2 SL)	Cyanamid BASF	2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1*H*-imidazol-2-yl]-5-ethyl-3-pyridinecarboxylic acid
imazethapyr + glyphosate	Extreme (2.17 EC)	BASF	see individual components
Kinetic (surfactant)	Kinetic	Helena	–
molinate	Ordram (15 G)	Zeneca	S-ethyl hexahydro-1*H*-azepine-1-carbothioate
nicosulfuron	Accent (75 DG)	DuPont	2-[[[[(4,6-dimethoxy-2-pyrimidinyl)amino]carbonyl]amino]sulfonyl]-*N*,*N*-dimethyl-3-pyridinecarboxamide
paraquat	Gramoxone Extra (2.5 SL)	Zeneca	1,1'-dimethyl-4,4'-bipyridinium ion
pendimethalin	Prowl (3.3 EC); Pentagon (60 DF)	Cyanamid	*N*-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine
Penetrator Plus (crop oil / surfactant)	Penetrator Plus	Helena	–
Peptoil (adjuvant)	Peptoil	Wilfarm	
Placement Pro-Pak (adjuvant)	Placement Pro-Pak	Wilfarm Wilfarm	
propanil	Stam 4M (4 EC); Stam 80DF; Super Wham (4 EC)	Rohm & Haas; RiceCo	*N*-(3,4-dichlorophenyl)propanamide
(propanil + molinate)	Arrosolo (3 + 3 EC)	Zeneca	(see individual components)
quinclorac	Facet (75 DF; 1.5 G)	BASF	3,7-dichloro-8-quinolinecarboxylic acid
RH-149109	–	Rohm & Haas	–
thiobencarb	Bolero (8 EC; 10 G)	Valent	*S*-[(4-chlorophenyl)methyl]diethylcarbamothioate
triclopyr	Grandstand (3 SL)	Dow AgroSciences	[(3,5,6-trichloro-pyridinyl)oxy]acetic acid

[z] '–' indicates information is not available or not applicable.

[y] Formulations are followed by amount of active ingredient per gallon for liquids and % active ingredient for solid formulations. Abbreviations for formulations: EC = emulsifiable concentrate; DF = dry flowable; G = granule; ME = microencapsulated; WP = wettable powder; SL = soluble liquid; F = flowable.

Appendix Table 2. Common, coded, and scientific names of plant species.

Common name	Bayer code[z]	Scientific name
Amazon sprangletop	LEFPA	*Leptochloa panicoides* (Presl) Hitchc.
Annual sedge	CYPCP	*Cyperus compressus* L.
Barnyardgrass	ECHCG	*Echinochloa crus-galli* (L.) Beauv.
Bearded sprangletop	LEFFA	*Leptochloa fascicularis* (Lam.) Gray
Broadleaf signalgrass	BRAPP	*Brachiaria platyphylla* (Griseb.) Nash.
Entireleaf morningglory	IPOGH	*Ipomoea hederacea* var. *integriuscula*
Hemp sesbania	SEBEX	*Sesbania exaltata* (Raf.) Rydb.
Ivyleaf morningglory	IPOHE	*Ipomoea hederacea* (L.) Jacq.
Northern jointvetch	AESVI	*Aeschynomene virginica* (L.) B.S.P.
Pitted morningglory	IPOLA)	*Ipomoea lacunosa* L.

[z] WSSA-approved computer code from Composite List of Weeds, Revised 1989. WSSA, 810 East 10th Street, Lawrence, KS 66044.

Appendix Table 3. Climatological data, Rice Research and Extension Center, Stuttgart, 2000.

	May			June			July			August		
	Temp.		Rain-	Temp.		Rain-	Temp.		Rain-	Temp.		Rain-
Day	Max.	Min.	fall	Max.	Min.	fall	Max.	Min.	fall	Max.	Min.	fall
	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)	(°F)	(°F)	(in.)
1	80	67	0.8	91	76		87	71		92	72	
2	81	63		92	74		89	78		90	70	
3	82	69	1.37	94	75	0.50	93	74		94	71	0.16
4	71	67	0.34	80	74	0.07	92	75		96	73	
5	76	68		75	71	0.62	92	78		95	73	
6	77	69	0.67	78	61		94	70		98	74	
7	79	69	2.02	78	61		95	76		98	74	
8	84	74		82	64		97	65		98	74	
9	84	73		86	71		95	65		98	74	
10	82	61		92	73		97	61		98	75	
11	78	64	0.54	92	83		97	75		100	72	0.18
12	88	78		93	74		97	74		94	67	
13	89	72		93	75		95	75		92	64	
14	78	64	2.36	88	77		98	75		95	68	
15	73	59		92	72	1.75	97	76		96	69	
16	74	66		88	77		100	76		100	69	
17	74	71		90	79		99	78		102	75	
18	80	74		85	75	0.28	99	77		103	76	
19	87	70	0.58	85	77	0.92	98	77		98	68	
20	78	70	0.16	88	77		101	78		94	68	
21	73	65	0.31	90	74		94	67		94	71	
22	78	70		79	73	0.26	85	66	0.09	100	73	
23	88	76		87	74		86	68		100	74	
24	91	76		92	80		85	63		98	72	
25	89	74		93	81		87	62		98	73	
26	87	75	0.09	95	78		90	64		100	72	
27	90	75		94	77		93	66		102	71	
28	89	75	0.63	85	77		96	68		102	71	
29	86	71		88	70	0.20	96	71		102	71	
30	89	73		84	73		90	69	0.17	104	72	
31	91	72					90	72		105	74	